Disenchantment with environmental education?: a longitudinal case study in a girls' secondary school (UK)

Thesis

DISENCHANTMENT WITH ENVIRONMENTAL EDUCATION?: A LONGITUDINAL CASE STUDY IN A GIRLS' SECONDARY SCHOOL (UK)

by

Amira Sumner BSc(Hons), MSc

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Abstract

DISENCHANTMENT WITH ENVIRONMENTAL EDUCATION?: A LONGITUDENAL CASE STUDY IN A GIRLS' SECONDARY SCHOOL (UK)

by Amira Sumner

A growing body of environmental education research suggests that environmental education has been unsuccessful in the achievement of some of its objectives. A dilemma exists – the environmental education being provided may be contributing to behaviour that is in conflict with the aims and objectives of this type of education. It was the aim of this research to build on previous work in order to describe the factors involved in a change seen in environmental disposition of UK secondary school girls. The methodological approach taken to this research was that of a case study, including both cohort (longitudinal) and cross-sectional aspects; also incorporating an action research approach taking the form of researcher diary, interviews, questionnaires and freewriting tasks throughout the 6 years of the study. Qualitative and quantitative approaches were used to analyse the empirical evidence. Freewriting was coded and a temporal-proximity grid was used to track changes in environmental concerns expressed by pupils through their schooling, key informants provided rich narratives of adolescent environmental thinking whilst statistics carried out on the questionnaire responses explored the wider-scale applicability of the data collected. The evidence is discussed with attention paid to factors relevant to the context – females going through adolescence. An *Environmental Behaviour Portrait* goes some way to visualizing the complex relationship between influences over environmental behaviour.

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I wish to thank the case study school, pupils and teachers alike, for allowing me to use my observations in such a formal way. The school provided financial as well as moral support throughout the study. Unable as I am to name particular individuals, I simply wish to record my heartfelt thanks to all those individuals whose paths I crossed, many of whom have touched my life forever.

I would also like to acknowledge the Amira Sumner who started this study, who grew and changed over the 8 years of its development, now, a somewhat different person to the one who first asked questions about environmental education provision.

I remain optimistic about the future of environmental education and I look forward to being part of that future.

It is fine for us to share skills with our students (not give them a fish, but teaching them to fish) but if they are not getting access to a pond in which to fish, the skills may remain dormant

Roche van Wyk

ABBREVIATIONS

ASE	Association for Science Education
BioSoc	Biology Society (case-study school club)
CEC	Commission on Education and Communication
CEE	Council for Environmental Education
DfEE	Department for Education and Employment
DWT	Dorset Wildlife Trust
EE	Environmental Education
EfS	Education for Sustainability
G.C.S.E	General Certificate of Secondary Education
HoD	Head of Department
HoY	Head of Year
FFP	Fauna and Flora Preservation Society
IUCN	International Union for Conservation of Nature and Natural Resources
LA21	Local Agenda 21
NC	National Curriculum
NCC	National Curriculum Council
NGO	Non-governmental organisation
P.G.C.E	Post Graduate Certificate of Education
PSHE	Personal, Social and Health Education
QCA	Qualifications and Curriculum Authority
RSPB	Royal Society for the Protection of Birds
RSPCA	Royal Society for the Prevention of Cruelty to Animals
SATs	Standard Attainment Targets
SATIS	Science And Technology In Society

SEN	Special Educational Needs
STS	Science and Technology in Society
UCAS	Universities and Colleges Admissions Service
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
UNESCO	United Nations Education, Scientific and Cultural Organisation
WCED	World Commission on Environment and Development
WHO	World Health Organisation
WWF	World Wildlife Fund
YOC	Young Ornithologists Club
YPTC	Young People's Trust for Conservation

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1.1 Identification of the Dilemma at the case study school

This research was begun as a response to the apparent failure of EE in the case study school. I had spent almost 8 years, 1996 – 2004, teaching science to all year groups (Years 8 – 13) in this school; and was still in the position of full time science teacher whilst I carried out the research project. Consequently, the methodological approach followed was influenced heavily by the circumstances in which I found myself. In carrying out the research under 'part-time' conditions, it lent itself to a more longitudinal study, allowing for the demands of the teaching role, whilst still ensuring a rich narrative would emerge from the evidence collected. The evidence gathering process had a somewhat sporadic nature, again a consequence of the academic and pastoral responsibilities that took precedence on a day-to-day basis. However, there were opportunities for more spontaneous observation and data collection, due to my presence as an integrated member of the scholastic community.

A reason for apparent failure of EE can be suggested if one considers the (oversimplified) goals of EE, in schools, to be to encourage development of positive changes in values in school children towards the environment and its related issues in order than they are confident, and skilful, in responding with environmentally responsible behaviour. The behaviour exhibited need not necessarily be (predetermined) formulaic conduct set by environmentalists, society in general or legislation. However, it could be a change in the way an individual conducts him/herself with respect to their surroundings and other people, such that they demonstrate a better understanding of their environment and the relationships and values they hold with all the elements that go to make up their environment (Wals *et al*, 1997). I perceived a difference in attitude towards the environment, environmental issues and EE between Year 8 and Year 11 pupils in the case study school. Pupils entering the school in Year 8 seemed to be much more enthusiastic

about the environment, and demonstrated a higher degree of optimism during discussions on environmental issues than Year 11 pupils, a change echoed in other research (Hicks and Holden, 1995). During Year 8 project presentations, encompassing a number of environmental issues, it seemed that pupils were fairly positive about the environment and did not consider there to be many barriers to the implementation of environmentally responsible behaviour by all members of society. As pupils moved up through school, discussions within Years 9, 10 and 11 classes demonstrated progressively more cynicism and distrust of the scientific and political communities, and an increasing lack of resolution towards adopting appropriate behaviours to different environmental issues.

Pupils received specific EE lessons in Year 8 and then again in Year 10, under the auspices of PSHE. Informal conversations with Year 13 pupils in 1999 suggested the negative feelings towards EE were stronger than those experienced in Years 10 and 11. Year 13 pupils expressed disinterest and resentment towards the EE programme at the school. Lessons focussed on issues such as recycling, energy efficiency and reduction in pollution. Sixth form pupils felt that the same topics were revisited year after year and that the outcome of all lessons was predictable, prescriptive, and of little relevance to themselves. In some instances the issue was deemed relevant but more environmentally sensitive behaviour would mean some lifestyle sacrifice that the pupils might be unwilling to consider.

1.1.1 Extent of the dilemma

Gigliotti (1990) suggests that, indeed, EE has been unsuccessful in the achievement of some of its objectives, an observation reiterated by Hungerford and Volk (2003). Gigliotti used the following definition of EE in order to make his suggestion,

'Environmental education is aimed at producing a citizenry that is knowledgeable

concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution' (ibid, p9).

Mrazek (2000) uses a similar definition with reference to the active participation of the individual, '*interdisciplinary process of developing a citizenry that is aware of and knowledgeable about the total environment, in its natural and built aspects, that has the capacity for, and the commitment to engage in inquiry, problem-solving, decision-making, and action that will assure environmental quality.'*

There have been some positive changes in the general environmental movement. The public does seem to be more environmentally aware and there has been progress in pollution reduction. However, the point that Gigliotti makes is that, although individuals appear to be more aware of the environmental problems, they see those problems as the responsibility of others and do not recognise their involvement in issue generation and development. His concerns lie in the fact that the increased awareness has led to highly charged emotional responses by the public that are based, in many cases, on incomplete ecological knowledge. The information lacking does not need to come from the teaching of more scientific principles. Instead, he argues that the information lacking is that of possible alternatives and positive action that can be taken by the individual. It seems that individuals have not changed their lifestyles to any great extent, rather they have been selective with the EE provided for them and changed belief structures such that their own value systems are supported. Payne (1997) quoted first undergraduate pupils who, upon reflection of their embodiment in action and interaction with a socio-environmental problem, expressed enlightenment regarding the connection between self and 'nature'. In spite of the progress made in the 'internal nature' of the pupils, the clarity of progress in 'praxis' did not exist. Pupils expressed acceptance of social and cultural determinism and submission to barriers of environmental praxis.

Traditionally, pupils have been taught in the different curriculum areas in a manner that aims to improve pupil cognition. Kohlberg (1981) opined, *'Insofar as educators do not critically examine the values that govern life and discipline in the classroom or simply opt for enforcing existing conventions, they "cop out" from really dealing with values issues, and they engage in subtle or blatant forms of indoctrination (p1)*. In this case indoctrination is the traditional transfer of knowledge teaching, or instruction, that may take place in any subject area. This indoctrination usually results in some form of assessment by which teacher and school success can be evaluated. In these curriculum areas the overriding principle is knowledge acquisition so that individuals can move on to more complex cognitive operations. Although typical in the approach to environmental studies (Elliott, 1995), this is not a suitable principle to use in EE, not least because of the disputed state of environmental affairs and therefore the questions raised about appropriate environmental actions (Lomborg, 2001). By its very nature, and contrary to some thoughts on EE (Shaw, 2003), EE does involve moral development, and cannot be taught in the conventional sense. There may well be a majority society framework of moral values, but individuals need to determine what their morals are and how they relate to this consensus. Pupils should have the opportunity to discover that *basic* moral values may be the same for all humans but different decisions may be made because of a particular context or setting. Values are personal; they will develop within an individual in response to experiences of his/her environment. Thus, pupils need opportunities to develop and adjust the values they hold. Indeed, research suggests (Halstead and Waite, 2001) that rather than upholding the duty set out by the Education Reform Act in 1988 (see section 1.2.2), education provision may well be 'knocking the spirituality out of pupils' as they enter adolescence; the subjective and non-assessable nature of their emotions often being decried across the curriculum, but perhaps more so in subjects such as science.

Plant and Firth (1995) recognised that the pattern evolved from the implementation of the NC was one of '*...prescription and conformity...* ' (p3), in which subjectivity, controversy and values did not play a role. They saw that this was not preparing pupils for the continually developing society they lived in; that pupils need to be encouraged to look at the world through critical eyes and have the confidence and individual thought that will enable them to deal with the controversial issues associated with the environment. Here the authors use a number of previously identified criteria to provide a working definition of 'controversial':

> '*... a controversial issue must:*
>
> - *involve value judgements, so that the issue cannot be settled by facts, evidence or experiment alone, and*
> - *be considered important by an appreciable number of people.'*
>
> (ibid, p4)

The reference to *values* points to the dilemma existing with the moral aspect of such issues (Reiss, 1997), that some behaviours are considered 'good' or 'bad' for the environment. Reiss (2003) argues that individuals may need guidance in the use of ethical framework 'tools' whilst exploring their ethical position to justify their moral code.

1.1.2 Symptoms of the dilemma in the case study school

The pupils at the case study school seem to develop from being a fairly adult-dependant generation in Year 8 to a group of generally autonomous individuals in Year 13. With this autonomy comes the observable lack of enthusiasm to discuss and act on environmental issues. In April 2000, individuals in Year 9, who had been members of BioSoc (the school Biology club) since their very first few days as Year 8 pupils, signalled dissatisfaction with the current situation and their possible withdrawal from the society. A

number of management changes were taking place at this time that required urgent staff meetings being called at short notice. Consequently, I, and a colleague who co-managed the society, could not attend BioSoc meetings for a period of two weeks. The pupils had been offered more control of the society activities and this seemed like a good opportunity for them to take the helm. They had been, repeatedly, provided with opportunities to take control of the direction of the society and become more autonomous and they had repeatedly declined to do so. In fact in the academic year 2000-2001 a schedule was drawn up, as suggested by the previous society members and control of running the meetings handed over to the pupils themselves. Another suggestion, from previous pupils, was that the meetings could be less regular and therefore they were proposed for once every 3 weeks. The enthusiastic Year 11 pupil that remained ran a very successful recruitment drive and she managed to cajole 3 of the previous members (now Year 10) into helping out. The first meeting involved the Year 11 pupil talking with the ten or so new recruits (all Year 8) about the programme for the year and the kinds of activities that were available, still stressing that the pupils could change the programme at any time. The Year 11 pupil went on holiday and it fell to the teacher to run a component of the second meeting – making wine – whilst two of the Year 10 pupils ran a bird box construction session. Four year 8 girls turned up to make wine, whilst no one turned up to make bird boxes. Once the Year 11 pupil returned from holiday, she called a meeting to regroup the Year 8 members again and generate momentum. Approximately ten pupils attended the meeting and, interestingly, issues that were raised by the Year 8 pupils related to them wanting to meet more regularly and to set their own programme for the year.

So the Year 10 pupils had, in the previous year, seemed to dislike being told what to do, but when asked to provide their own suggestions and act on them, they showed lack of thought, originality and they lost all interest. The Year 8 pupils seemed enthusiastic and had many ideas for the programme, although not all strictly suitable for a biology society!

This echoed the behaviour demonstrated by the previous members of the society when they were all in year 8 but it did not carry beyond their first year.

Towards the middle of the spring term, the Year 11 pupil turned her focus on upcoming external examinations and decided not attend the club meetings; the teacher took up this organisational role. This was followed by a decline in attendance of the Year 8 pupils. The Year 10 pupils showed a further loss in interest and eventually, when they had failed to turn up to a number of meetings, they informed the teacher in charge they had decided not to carry on with the club. Due to the absence of pupils at meetings held, the teachers in charge decided to cancel any further meetings that year. There was one extraordinary meeting held, when a local member of the community brought in two fox cubs she was rearing for an animal welfare group, which brought in a record attendance of around thirty five pupils from across the age range.

The following year the club had a change of name in response to the suggestion made by the Year 11 pupil from the previous academic year; the pupil had now moved to another part of the country. It was renamed *The Natural History Club.* The club was run on the basis of meetings being called as events arose. The first being a conservation competition, run by Barclaycard and YPTC, launched to encourage as many new members as possible. The prize, an environmental holiday of their choice, resulted in approximately fifty pupils enquiring, which ultimately reduced to in the region of 12 pupils, possibly due to the 'calming effect' of half-term. The competition encouraged large groups to work together to produce a conservation/ environment themed project that was to be submitted 4 months later for judging. There was interest from two sixth form pupils to help the Year 8 pupils in their quest. However, once it was clear that only the Year 8 pupils qualified for the holiday prize the sixth formers lost their 'interest'.

1.1.3 Pupils' need for evidence of their efficacy in action

In the case study school it does appear that pupils seem to be progressively more displeased with the position they take within the school system. They are dissatisfied with the rules placed upon them by school and their position in the school community and, consequently, their perceived effectiveness in society. Posch (1993) writes of similar experiences to those in the case study school. He considers that skills in decision making relating to the environment that was once the domain of 'experts' is now falling into the realm of responsibility of the pupil and members of the general public. The more traditional school system is not geared to this type of challenge and consequently pupils are unprepared to deal with controversial issues that are the hallmark of environmental concerns:

'The cultures of teaching and learning are still attuned to a relatively static society, in which the necessary knowledge, competences, and values are predefined and stored in curricula, tests and accredited textbooks.'

(ibid, p26)

Posch referred to a project concerning a Swedish school, where pupils studied the water of two lakes, in an area that had been heavily polluted by acid rain. The local population had given up hope of remediation and so the pupils set up activities to make a link with this population. The public authorities helped them and a programme of water quality improvement (by supplying lime) proved a new shred of hope for the locals. The school in question became well known for the initiative and many copied it. The problem became that the only aspect left was the physical movement of buckets of lime to the frozen lakes and pouring lime onto the ice. This did not now require the creativity and dynamic approach demonstrated by the initial school. Only the technical element remained. Posch regards the difference in the range of influences young people feel exposed to and the actual opportunities they have to exert their influence on, and feel

respected in, society as an important factor contributing to the increasing dissatisfaction of individuals with their role in society and school. He goes on to highlight the idea that this turn of events could be changed if individuals feel that their involvement is making a difference in the present and not just for a future benefactor. This echoes verbalisations made by Year 9 pupils in conversation during this study. There is an element of impatience in the need to see results to an activity, almost before it has begun; but this is a variable that affects motivation to continue with the environmentally responsible behaviour.

Individuals are influenced by the outcome being favourable to themselves, and in the case of pupils, this may be in the form of praise from the school, or even wider, community. The successful projects he discusses are those that have a finite position; they have a definite end point from which no further action is necessary by the pupils, unless the situation arose again. An example of this is the removal of illegal waste dumps. By involving local support and press coverage, pupils were able to effect a change in their public authority's action and the dumps were removed. This project in itself is complete; the pupils are praised and receive publicity relating to their success. The difference between this and the lake example is that, in the latter, a long-term, and relatively unpublicised effort is required in which no further changes may be observed, rather, the objective being to keep the *status quo*.

1.1.4 Teacher-researcher experience of training in environmental education

During my Initial Teacher Training, in 1995/6, two guidance sessions were provided, each of two hours, on EE. An individual from WWF Education Department ran one session; an education officer from the RSPB took the other. Both of these speakers gave the benefit of their experience in teaching environmental issues to school children and, in addition, highlighted the limited written guidance provided by the Science NC

Statements as the link between Science and EE. This minimalist provision is probably not unusual, and is echoed by Fien *et al,* (1993), Clubbe (1993) and Gayford (1995).

The theory presented on how to provide EE did not seem to be in congruence with the realities in the teaching practice schools I attended. Both practice schools had limited resources and one in particular did not provide education 'outside of the classroom'. The teacher in charge, in this latter school, supported this decision by referring not only to the lack of equipment necessary, but also to the lack of enthusiasm he had towards the subject area. These reasons are echoed by reports of constraints on the provision of EE in schools (Gayford, 1993; Robertson and Krugly-Smolska, 1997; Payne, 1999; Grace and Sharp, 2000; Jimenez and Lopez, 2001; Littledyke, 2003; Grace and Byrne, 2003).

It is my opinion that the provision made by the teacher/educator should not only be measured in terms of the practical equipment available, but also in terms of the personal, affective, provision. An important factor involved in the provision of EE is the level of *environmental literacy* (Orr, 1992) of the teacher. Hsu and Roth (1998) use this 'catch-all' phrase to include some of the very personal aspects that play a crucial role in the teacher as environmental educator.

1.1.5 This research

The problem in the provision of EE at the case study school was identified in section 1.1. This is a dilemma – the EE being provided may be contributing to a resulting behaviour that is in direct conflict with the aims and objectives of this type of education. It is the aim of this research to build on previous work in order to describe the factors involved in the change seen in environmental disposition of secondary school girls. For educators to make radical changes to the EE provision, a clearer understanding of the problem is required.

This research, in itself, is <u>not</u> designed to lead to radical changes in EE practice. This is a limited case study; in the sense that the data collected from the school pupils during the time of the case study may well not be repeated or continued beyond the life of the study. However, it is not a study in isolation, in that the data collected and the methods used are highly influenced by previous research. Wals *et al* (1997) recognize the use of data from this type of research as generalizable when *'..viewed as a process of dialectic between the reader and the author'* (p255).

It is my intention to add to the extensive information available, to contribute to the understanding of the process of EE at the secondary level, and thus its continued development. Education research in school is problematic in so much as it is difficult to isolate causal agents due to the complex interaction of school and other out-of-school influences. Unlike a natural sciences research topic, the investigation cannot be 'controlled'. This research is not being undertaken to provide an instant, rigid framework of rules (Hegarty, 2003) by which teachers should approach EE, rather it is hoped that perhaps it will achieve the purpose that Hammersley (1997) identifies:

'The nature of the contribution may be closer to the enlightenment model, involving the provision of information that corrects assumptions or alters the context in which teachers view some aspect of their situation, for example by highlighting possible causal relations to which they may not routinely give attention.'

(p10)

Nevertheless, Hammersley disagreed with much of David Hargreaves' call for sound 'evidence based' teaching:

'However, there are dangers, I think, in this kind of work being required to be 'scientific'. It is designed to serve a different purpose, so that, while there will be some overlap in techniques and relevant considerations, the orientation should be different. I would not deny that there is much wrong with the quality of teaching in schools, nor do I

believe that research is incapable of providing knowledge that is of practical relevance to improving it. But it seems to me that educational research can only play a fairly limited role in resolving the problems. It can highlight and analyse them, and attempt to provide some understanding. But remedying the failings of schools is a practical business that necessarily depends on professional expertise of a kind that is not reducible to publicly available evidence, even that provided by research.'

(Hammersley.M , 1997)

In drawing on current theories and previous work within this field, and building on it with evidence collected at the case-study school, this action research (Wals *et al,* 1997, Robottom 1987, Di Chiro 1987, Robottom and Hart, 1993) may go some way to meeting these requirements, since it is informed by relevant experience (Rosenblatt, 2001) and professional expertise from the participant author.

1.2 The Developing Focus of Environmental Education

The accepted goals of EE have taken a long time to develop. Although now there exists the desire to effect changes in values, attitudes, commitment, skills and behaviour (Hill, 1999a), to more environmentally sensitive expressions, this was not always the case. Historical literature shows the progression of EE from a time when knowledge about the environment was not available to the general public, to a more co-operative type of education for action. Encouraging its development is one of the most challenging tasks for educators. Success cannot be assessed in the same examination format of curriculum subjects.

Educators may suggest that there has been success in their provision of EE if they observe positive behaviour changes in individuals, but often overlook the evidence of development of values and beliefs necessary for environmentally sensitive citizenship.

1.2.1 The first signs of an emerging discipline

One of the first, British, radical ecologists, Patrick Geddes, voiced concerns for the environment years before they were being taken with the seriousness they deserved. Marshall Stanley wrote in 1972 that '*Geddes understood there is only one environment, and that, without a meaningful public environment, the creation and maintenance of a self-contained environment is an illusion which will destroy mankind.*'

(Small, 1998)

Geddes inaugurated the Environment Society in 1884 and devoted his life to activities that involved exploration of alternatives to political and social organisation, such as urban renewal projects. However, it seems that his involvement in education was only at an academic level.

In 1889 the Society in Didsbury was formed; they claim a very early start in schools education, in 1901 (RSPB, 2003). The Bird and Tree Scheme was initiated in

1902. Could this be one of the earliest projects to encourage awareness, empowerment and action in young people?

The *interdependent relationship* man has with the other species on earth was beginning to achieve standing (FFP, 2000); individuals began to look at the effect of mankind's activities on life in the future, rather than simply being concerned with the resources available for the consumer population of the present.

The, now, RSPB set up the Junior Bird Recorders Club in 1943, an early type of informal active EE. Due to the projects very nature, the young people would become more aware of their surroundings; they would be acquiring knowledge and skills that would undoubtedly be affecting their values and attitudes. Most importantly, the project provided the opportunity for the development of commitment and behaviour change relating to an environmental issue (management of changing bird populations). In 1948 the IUCN was set up, having a variety of Commissions whose missions are specific to the area of expertise the members bring with them; their aim is to go beyond providing information which *'... does not necessarily lead to a change in behaviour by people'*, recognising that *'... it is necessary to involve people to actively work to find solutions'* (IUCN, 2003).

For a time leading up to the beginning of the 1960s, a number of scientists and parliamentarians had been warning of the overuse of chemicals in the countryside. It was the advance in synthetic pesticide and fertiliser use in agriculture that led to a crisis in the countryside,

'...The discovery of the insecticidal properties of the synthetic organic compounds, at about the time of the Second World War, brought about a dramatic change in the pattern and in the consequences of pesticide uses. In a remarkably short time, they were being used on almost every crop and in most countries of the world. The immediate benefits were obvious, but it gradually became apparent that these new compounds had

severe drawbacks. They were affecting wildlife and people in ways which had not been anticipated.'

(p18, Conway.G.R. and Pretty.J.N, 1991)

Between 1960 and 1962, there were some particularly heavy losses of wildlife, in the UK, due to toxic chemical use (Shackleton, 1962). 1962 saw the publication of a book that many herald as a major turning point in the environmental movement. American author, Rachel Carson's *Silent Spring* was to bring environmental science into the household. It was not the first publication to refer to the requirement of man to co-operate with nature and avoid the over use of its resources. Pinchot and Osborn had both written of the need to conserve species for future generations earlier on, in the first half of the 1900s (Disinger, 1990). However, Rachel Carson's book made a real impact on the general public and her approach was not totally anthropocentric in perspective. It provided careful explanations of how science was not the "all-knowing", "all-powerful" entity it had been built up to be, in fact she made her socially critical approach clear to the reader:

'The choice, after all, is ours to make. If, having endured much we have at last asserted our 'right to know', and if, knowing, we have concluded, that we are being asked to take senseless and frightening risks, then we should no longer accept the counsel of those who tell us that we must fill our world with poisonous chemicals; we should look about and see what other course is open to us.'

(p240 Carson.R, 1962)

In the UK, 1968 saw the formation of the CEE, *'... the umbrella body for environmental education in England, Wales and Northern Ireland, working closely with its 80 member organisations to promote and develop policy and good practice'* (p1 section 5, CEE, 1996). The latter part of this statement pointed to an EE process built on firm

objectives. The UN Conference on the Human Environment was held in Stockholm in 1972, providing environment issues with a powerful soapbox and showing the first signs of educating the public about consequences of our consumer society and the changes necessary for care and preservation of the environment. In 1975 the international workshop on EE, held in Belgrade (under the auspices of UNESCO) aimed *'to review the trends and emerging issues in environmental education and to formulate guidelines and recommendations for advancing the movement internationally'* (Robottom, 1987). This resulted in the formulation of the Belgrade Charter, which included the political influences on EE, entitled 'Environmental Situation'; an international statement that one could consider to be fairly prescriptive. The Tbilisi Conference, the world's first intergovernmental conference on EE, followed in October 1977 (a joint venture between UNEP and UNESCO) leading to the formation of the Tbilisi Declaration; an agreed platform on which to base the development of EE across regional, national and international levels. Nevertheless, the following few years saw varying and, in many cases, limited results.

1.2.2 Environmental matters in the UK Secondary Level Curriculum

Over this time, education in the United Kingdom was essentially determined by local scale preference. However, with the passing of the Education Reform Act in 1988 and the implementation of the NC, a somewhat uniform approach was projected across the UK in the teaching of curriculum subjects. Within the 'Preliminary' of The Act there was a clear statement of duty in educational provision that would by its very nature, based on agreed goals, come to require inclusion of EE,

(a) promotes the spiritual, moral, cultural, mental and physical development of pupils at the school and of society; and

(b) prepares such pupils for the opportunities, responsibilities and experiences of adult life.

(HMSO, 1988)

This statement remained almost identical in section 351 of the 1996 Education Act (HMSO, 1996).

Having been referred to, in the Bruntland Report (WCED, 1987, p8), the concept of sustainable development was given a great deal of publicity with the publication of the Pearce Report in 1989. Sustainable development is one of a number of terms (such as sustainable growth, sustainable use) that has grown from this platform, and are quite often interchangeably used as part of a growing environmental vocabulary (Disinger, 1990). The authors of the report reviewed an economic framework for valuing and accounting for the environment, thereby providing the UK Department of the Environment with a consensual meaning to the term 'sustainable development' (Turner, 1991, p209). In order to fulfil the philosophy of sustainable development and other commitments related to environmental policy (HMSO, 1990; Cole-Hamilton, 1994), a framework for EE was becoming necessary.

In the late 1970s there was SISCON ("Science in a Social Context"), a project that aimed to teach socially relevant science to post 16 pupils (Solomon, 1980). During the 1980s this was joined by numerous SATIS project publications, with variable uptake by UK science teachers (Solomon, 1993; Lock and Ratcliffe, 1998; Watts and McGrath, 1998). However, up until 1990, very few authors actually addressed one fundamental issue, that of EE *for* the environment, ***for action***. The NCC, in Britain, published a number of Guidance booklets which could be used by educators in teaching, non-statutory, cross-curricular subjects, of which one was Curriculum Guidance Number 7: Environmental Education (NCC, 1990). As stated in the Tbilisi Declaration, this looked at providing for development of the pupils':

1- **Knowledge and Understanding**; as a basis for making informed judgements about the environment

2- **Skills**; a total of six cross-curricular skills that could be developed through environmental education

3- **Values and Attitudes**; promotion of positive attitudes to the environment to encourage its safeguarding for the future.

This focussed on EE being made up of three strands:

1- Education ABOUT the environment

2- Education FOR the environment

3- Education IN or THROUGH the environment

(taken from NCC, 1990)

Terms first coined by Arthur Lucas in the 1970s (Robottom, 1987). By engaging in certain activities, such as pond dipping and identifying of species caught for a classification lesson, one can by the nature of the activity say that EE is taking place. In this way it can be deemed that strand 3 is being attained. However, this form of education is not necessarily going to be ***for*** the environment; putting issues with this meaning, itself, aside (Jickling and Spork, 1998).

This is the dilemma of EE. The education being provided may not be encouraging the reflexivity and possible change in individual lifestyles that is deemed necessary for a healthy future for the planet, its *raison d'être*. It is this dilemma that will be addressed in this research.

Webster (1996) criticised the cross-curricular booklets as too prescriptive in format. They were designed to help teachers to deliver a cross-curricular theme in such a way as to encourage probing, enquiry and development of thought and yet the help was presented as discrete units to be followed methodically. He blamed lack of impetus and finances for the failure to achieve the commendable objectives of this and other, similar, projects. Rather

than implementing formulated strategies, Webster discusses the possibilities of encouraging critical and explorative skills within the existing secondary framework. However, he summarises his chapter with a prediction that the education system will change, quite radically, from its current arrangement that includes EE, to one of education for sustainability, to become more in tune with ecological principles.

Within the Science NC Orders (England), a statement made about the 'Application of Science' in the Programme of Study, alluded to the teaching of environmental matters (p14, DfE 1995) at Key Stage 3. During Key Stage 4 studies this was expanded (p24, DfE 1995):

> *a consider ways in which science is applied and used, and evaluate the benefits and drawbacks of scientific and technological developments for individuals, communities and environments;*
>
> *b use scientific knowledge and understanding to evaluate the effects of some applications of science on health and on the quality of life;*

These first two statements suggest a separation of human and non-human environment. Statement b's *prima facie* reading conjures up images of medical developments, health and hygiene applications for humans.

> *c relate scientific knowledge and understanding to the care of living things and of the environment*
>
> *d consider competing priorities and the decisions that have to be made about energy requirements, taking into account relevant social, economic and environmental factors;*
>
> *e consider the power and limitations of science in addressing industrial, social and environmental issues and some of the ethical dilemmas involved*

These later statements point to the underlying ethic of humans as caretakers or managers of the rest of the environment; with scientific knowledge as power, one is able to deem what

is best for the environment. Only in the last statement does one see lip service paid to the affective domain that is central to EE. Nevertheless, EE, *per se,* still fell outside of the NC and so the degree to which pupils experienced this remained a matter of school, and frequently teacher, preference (Gayford, 1995).

1.2.3 Developments in National Environmental Education Policy

Within Article 12 of the *UN Convention on the Rights of the Child* (UNEP 1989), which was ratified by the UK Government in 1991, there is provision for the right of children to express their opinions on matters that affect them and expect to have their views taken seriously. In addition to this, children have the right to any educational and vocational information and guidance available (Article 28(d)) including that which develops respect for the natural environment (Article 29(e)). Furthermore, Agenda 21 states *'education is critical for promoting sustainable development and improving the capacity of the people to address sustainable development issues'* (Chapter 36, Agenda 21, UNCED 1992). The 1992 UNCED Earth Summit agreements have not been a resounding success but Agenda 21 is being transcribed to the local level (LA21) and local communities are beginning to have more control over their own immediate environment. The case study's county responded well to this challenge and the EfS network was launched July 1998, as part of this response. It aimed to provide a link between educators and other professionals working in the EE field (in its widest sense). The main objective of this participatory group was, and still is, to encourage the spread of good EE practice, and to provide opportunities for sharing of resources.

However, a survey carried out on a number of schools, in the UK, suggested that EE was not consistent across schools and in fact had low priority (RSPB 1992). This survey was carried out on a random sample of schools in the autumn term of 1991. In summary, it found that 80% of secondary schools did not have an agreed EE cross-

curricular policy and, more interestingly, 46% of those schools stated that they had no intention of producing one. This statistic did not expose the degree of EE that was taking place or the extent to which interdisciplinary learning took place. Nevertheless, a lack of attention to a school wide approach may at the very least lead to fragmentary and repetitive provision.

Numerous publications were developed with the intent of helping educators to provide for Article 29(e) of *The Convention* (SCAA 1996; Oxfam 1997). However, the degree to which a school applied the guidance, beyond the statutory requirement, was left at the discretion of the school itself.

As a continuing part of UNESCO's involvement in EE a conference was held in 1997, in Thessaloniki (Greece), which focussed on sustainable development education clarification. Phrases used indicated attention to social changes:

'stimulate awareness'

'Education....as a means to bring about changes in behaviour and lifestyles...'

'education....as an instrument of choice'

(Hill, 1999b; UNESCO, 1997).

Indeed, in the conclusions of the conference, special attention was directed towards the central importance of education in the attainment of sustainability, with the identification of science education as not only providing the technological means, but also advancing well informed, ethical decision-making (Ospina, 1997). This international espousing of the role of science education in the growth and development of all members of society (Millar and Osborne, 1998), and consequently, its influence on EE success (Ashley, 2000a) was to be reiterated at the national level.

1998 saw the publication of a report for DfEE/QCA that outlined the *'effective inclusion and integration of education for sustainable development into the school curriculum'* (QCA, 1998a). At the same time, a report was published that referred to the

requirement for education for citizenship in schools, referring to a healthy society being one that is made up of individuals who care about their future and that of their environment (QCA, 1998b). Individuals involved in EE[1] now saw an 'in-road' for education for sustainability; its route forward possibly lying in the promotion of active citizenship by schools.

[1] Pers.comm. with members of EfS Network 8th Sept 1998

1.3 Sustainable development education in the UK Secondary Level Curriculum

The new millennium has brought with it new ideals and new promises. The British Government (then a relatively new Labour government) placed emphasis on the changes needed in the education system. The new NC documents, published in 1999, made it clear that *entitlement for all pupils* and *citizenship* were firmly on the agenda. The importance placed on education as a training ground for life was made clear on the NC web site,

'*... Foremost is a belief in education, at home and at school, as a route to the spiritual, moral, social, cultural, physical and mental development, and thus the well-being, of the individual. Education is also a route to equality of opportunity for all, a healthy and just democracy, a productive economy, and sustainable development. Education should reflect the enduring values that contribute to these ends. These include* ***valuing*** *ourselves, our families and other relationships, the wider groups to which we belong, the diversity in our society and the* ***environment*** *in which we live.'*

(DfEE and QCA 1999a)

The importance of the affective domain in education was reiterated in Aim 2 of The NC Handbook for Secondary Teachers in England (DfEE and QCA, 1999b), however, identification of individuals as consumers with rights and responsibilities had more than a passing similarity to the caretaker, management role suggested in the 1995 NC (section 1.2.2).

This new NC identifies the obvious four curriculum areas where e*ducation for sustainable development* could take place, namely Science, Geography, PSHE and Citizenship, and it is this 'specialist' approach that immediately conflicts with elements of the philosophy of EE for sustainability (Tilbury, 1995). In spite of this, some progress can be seen. Citizenship began to provide specific environmental knowledge that had often only been in the realm of the most environmentally enthusiastic pupils. For instance, Key

Stage 4 pupils would be formally exposed to the concept of LA21 and how responsibility is being delegated to the individual. However, as with most curriculum subjects, the depth of exploration of the individual programme of study statements will vary at both the school and teacher level. Nevertheless, it does seem that EE may well be best served by Citizenship rather than PSHE, whose guidelines remain non-statutory. Gough (1987) regards this form of 'curriculum enhancement', whereby discrete packages of EE are 'delivered', as *'preserv[ing] the teaching practices and learning experiences that go with a fragmented worldview'* (p 53).

In the introduction to the Science Programmes of Study (Key Stages 1-4; DfEE and QCA, 1999a), science is identified as a suitable approach to education for sustainable development, explicitly pointing to values and ethics exploration when considering science and technology application. Within the new Key Stage 3 Programme of Study for Scientific Enquiry pupils should begin to take account of the fact that different people may have different opinions on the same topic. A fairly major leap forward here is that the pupils should begin to try to understand <u>why</u> this is so. However, this is a non-statutory section of the curriculum, consequently the degree of provision will differ from school to school. Within the Science 2 unit at Key Stage 3, *Living things in their environment,* an extra teaching element has been included in *Adaptation and Competition* that provides for statutory teaching of sustainable development, again with the reference to the custodian role of humans on non-human environment. This is still an important extension to this curriculum component as it enables the exploration of past, present and future conservation efforts that previously remained in the category of 'natural history', fascinating but not examination material, therefore often neglected. At Key Stage 4 this statement has been reduced down to a 'fact-exposing' task about the significance of sustainable development, which in itself, presupposes agreement on a single, uncomplicated understanding on the use of the term. This follows a statement, which has remained relatively unchanged,

regarding the impact humans have on the environment and the factors associated with their impact.

Although the statements added are quite short and vague, their effects on the teaching time and the material to be covered could be quite dramatic. Grace and Sharp (2000) point out that '*Although there is no explicit mention of biodiversity, it is implied that, as an underlying principle, pupils should reach a level of understanding and awareness about conservation issues and the need to protect living things'*. This implies that the level reached could well involve attitude and value changes, a welcome move towards a more explicit identification of opportunities for pupils to explore and develop values to their environment (Goodwin, 2001).

Nevertheless, this approach still treats sustainable development as a discrete unit of knowledge that can be packaged into an assessable format, rather than it being an exploration of models for ways of living, determined by the life choices each individual will make, practically, on a day-to-day basis. There are concerns from some researchers (Jickling, 1992) that there is a lack of understanding or consensus on the meaning of the term 'sustainable development', an issue that affects policy making (Bonnett, 2002) and effective education (education *for* the environment, within the existing dominant educational paradigm).

1.4 Education for responsible environmental behaviour

"Good education is, in part, about increasing access to the knowledge and skills needed to make informed decisions about our relationship with the rest of the living world. It is inevitably concerned with the development of attitudes and values." (p1, CEE, 1997)

The ASE (1998) accepts that there are particular purposes to EE, which are aimed at developing the cognitive and affective dimensions of individuals, encouraging them to react, to use appropriate skills in active and informed citizenry. Hsu and Roth (1998) summarised these aims in the phrase *'environmentally literate citizenry'* as a major outcome of EE.

Evidence suggests that young people, particularly, show high levels of environmental awareness and concern (Ballantyne et al, 1998; CEE, 1997). However, there is also evidence that pupils feel an increasing level of disempowerment in relation to the environment and environmental issues (Connell et al, 1999), this may manifest itself on a short term basis, as pupils pass from one academic year to the next; as well as on a more long term basis, as pupils move from pre-adolescence towards adulthood[2].

The CEE consider there to be three aspects of the individual which need attention when providing biodiversity education or *Educating for Life*; factors that have much in common with promoting sustainable development (as opposed to being about sustainable development – section 1.3):

1- The Active Citizen - skilled in activities that would allow them to actively participate in public and political debates as well as respond actively as an employee or volunteer

2- The Discriminating Consumer - act to reduce resource consumption, make consumer choices and refuse products based on unsustainable practice

[2] Pers.comm.case study EE coordinator 20/05/99

3- The Concerned Individual - demonstrating understanding of the relationship between social values and environmental issues, attuned to the distinctiveness and cultural elements, prepared to take personal responsibility in the light of rights and responsibilities of others

(adapted from CEE, 1997)

It is likely necessary to incorporate all of these aspects of a person into EE provision at school, if educators are to go any way to encouraging exploration and development of positive values and attitudes towards their environment, both locally and globally.

CEE reported the '*... tendency to attack education about environmental issues on the grounds of sentimentality, inaccuracy or just bad educational practice.*' (ibid, p22). However, the call for best available science does not necessitate the divorcing of affective from the cognitive. At this point in time, there seems to be a great need to review the methods and means by which the education is provided (Chen, 1997).

EE, by its very nature, is necessary at all stages in an individual's life, from pre-school through school and beyond (lifelong learning) and of concern to succeeding generations. References to education have been made in an abundance of international documents on environmental and development issues (Palmer, 1998), from organisations such as IUCN, UNEP, WWF and WCED. Unlike some scientific advances, such as the eradication of smallpox, sustainable development does not entail a once and for all measure. Each successive generation may need to build on and modify the approach taken towards the environment; the practices of sustainable development may need to evolve in parallel with the social and economic development of the global society. This evolution does not necessarily mean a progression to new, more modern, practices; it may involve a return to those activities or thoughts considered more 'traditional' (Orr, 1994).

1.5 What is causing this dilemma?

In one edition, the BBC programme 'Countryfile', explored a variety of projects and activities that take place across the British Isles, encouraging young people to become involved in tackling environmental issues (BBC, 2000a). An RSPCA Education Officer, interviewed about her school's programme, stated that research showed that children's attitudes towards animals are formed by the time they reach 8 years of age, and so pupils needed to be educated very early on to develop positive attitudes. The interviewer made the connection of attitudes towards animals and attitudes towards the environment and environmental issues and, thus, the need for EE very early on in a child's life. All the children involved in the activities and projects shown in the programme were under the age of thirteen.

- Whilst this is obviously desirable, is it at the expense of the older child?

The 3rd International Children's Conference took place in Eastbourne, South England, on 22-24 May 2000. This was aimed at children aged 10-12 years old. WWF sent three youth representatives to South Africa during the Earth Summit 2002, one aged 10, two aged 11 and one aged 17 years (WWF, 2002); whilst the Catholic Youth Movement sent three youths aged between 12 and 14 years (Ashley, 2003).

- Is this indicative of restricted involvement in environmental activities, generally, for older secondary school pupils?
- Might this provide some explanation for the negative attitude pupils develop as they move from Year 8 to Year 11 in the case study school?

Once the pupils reach adolescence they perceive that they are no longer encouraged to participate in decision-making and environmentally responsible action.

- Might this be when a feeling of disempowerment develops?

So:

- ***What*** are the motivations this group of young people have to keep up positive environmental behaviour?
- ***What*** changes take place in their perceptions of environmental issues?
- ***How*** do their attitudes and values develop during this period?

These questions lie at the hub of this research and answers to them should go some way to understanding the social dilemma.

'Identification of negative views can be as informative if not more so, as focusing on positive values. An appreciation of the gaps between the views of children and those advocated by scientists can be useful to educators planning new teaching programmes... '

(p50, Grace and Sharp, 2000)

2. The Case Study School

2.1 Its origins

The case study school has a history spanning almost a century. The school was set up at the beginning of the 1900s in a popular south coast town. It was the intention of the founder to provide the town with a secondary school for all those over the age of nine. When it opened there were just 14 pupils enrolled, but in five years this had risen to 98. In the late 1930s the school changed from mixed to single sex. The boys and masters moved to a different site whilst the girls and the mistresses stayed in the original building. During the war the numbers of pupils increased dramatically as evacuees arrived from London. The building was declared unfit and a new site was chosen for the school. In the 1960s, after the move to the new building, the school saw five changes in Headmistress between then and the time of writing this study. The school received Grant Maintained status in July 1991, which changed to Foundation status in September 1999.

2.2 The fabric of the school

The school stands on land situated between a residential area and an industrial estate on the outskirts of the main seaside town. It consists of one large main building, a language centre, music and sixth form building and a number of prefabricated stand-alone classrooms. A variety of fund raising events had led to the addition of a multi-gym, a new drama studio and a minibus, all within a period of 6 years. It is a selective school with pupils coming from a wide range of areas, some travelling more than twenty miles by car, bus and train. Table 1a shows the number of pupils on role in the academic year 1999-2000, these are typical values for each year group. In chapters 4 and 5 the terms 'cohorts A, B and C' are used to refer to particular tutor groups involved in provision of evidence during this study (section 4.1.2). Table 1a also indicates to which year group each of these

cohorts belonged, and identifies to which year groups the primary and secondary key informants (responsible for narrative evidence) belonged (sections 4.3, 5.2.2 and 5.2.3). The use of the term key informant will be discussed in chapter 4. Table 1b summarises the age groups of the pupils that were part of the qualitative aspect of the study. A complete longitudinal timetable of evidence collection is shown in section 5.1.1.

Table 1a – Number of pupils on role in academic year 1999/2000

Year Group	Number of Role	Contains study (tutor) group	Contains key informants
8	154	cohort C	
9	170	cohort B	secondary
10	171	cohort A	primary
11	158		
12	187		
13	149		

Total teaching staff = 60

Table 1b – Temporal location of pupils included in qualitative aspect

Academic Year	Primary key informant – (Kirsten) within Cohort A	Secondary key informant – within Cohort B	Cohort C	Peripheral Interviews in section 5.4.1.1	Peripheral Interviews in section 5.4.1.2	Peripheral Interviews in section 5.4.1.3
1996-1997	Teacher-researcher observes and develops a 'sketch' of the situation					
1997-1998	Yr 8					
1998-1999	Yr 9	Yr 8				
1999-2000	Yr 10	Yr 9	Yr 8			
2000-2001	Yr 11	Yr 10	Yr 9	Yr 11		
2001-2002	Left case study school	Yr 11	Yr 10	Post-16	Yr 11	Yr 10/Yr 8
2002-2003		Post-16	Yr 11		Post-16	

Location of interview reported in this study denoted by shading ■

The year 8 intake is normally 6 classes, but this was expanded to 7 in the 2000-1 entry. The pupils in Cohort C had been a *trial* year for accommodating the first-year pupils in an 8-classroom standalone block outside the principle school building. Not only did the year 8 pupils register and spend tutor time in these rooms but also, in addition to this, it

was decided to place much of their timetabled lessons in their form rooms. This led to a sense of isolation from the rest of the school and teachers remarked on the poor participation level, of this year group, in extra-curricular activities such as music and sport.

In the 2000-1 academic year it was decided to use the standalone classroom block as an overflow for some 6th form tutor groups, study rooms and a little 6th form teaching. The year 8 pupils in the 2000-1 cohort were based back in the principle building and, consequently, the uptake of extra-curricular activities was found to have returned to the 'normal' level. The author's observation of the participation issue with the Biology Society was taken from the years preceding this trial housing, consequently, conditions of 'housing' was much the same for every year group included in the study and, therefore, is likely not a contributing factor to club attendance.

2.3 Status of staff relationships in the school

During the time of the research project (1996-2002) the school was in a transition period. A previous Head teacher, in position just before the current post holder, had been in position for two years and a number of changes had been instigated that did not always meet with staff support. The internal and external problems being faced by the staff and pupils led to tension existing between all levels of the school hierarchy. Nevertheless, it was envisaged that the tension and any resulting conflicts might positively benefit the research. When procedures are flowing smoothly and everything seems to be 'right', it can be difficult to reflect on a situation and determine what aspects are contributing to its status. When there is difficulty in provision of any kind, in this case education, the problems encountered can actually lead to the determination of these very aspects.

The staffing structure changed considerably at the school during the time that the Head teacher was in office. At the end of the academic year 1999-2000, approximately 10 staff left the school including the Head teacher and the relatively new Deputy Head teacher. The school was without a Head teacher until the January of 2001. Workload remained a key burden affecting individual staff but concern over job security evaporated. With the new post holder came a period of consolidation and only 3 teachers left at the end of the 2000-2001 academic year. Throughout the study there have been trainee teachers in the school. Only one of these student teachers was directly involved in providing EE, this was as part of the Biology scheme of work in Year 8 (section 5.5.2).

2.4 School environmental education policy

In September 1995, before the research project was begun, the EE policy of the school was reviewed and re-written. It now stated that *' Environmental Education should provide pupils with opportunities to evaluate evidence for and against environmental issues. This will help them to clarify their own stance with regard to these and to realise that others can hold different equally legitimate points of view.'* [3]

At that time a large proportion of EE, as proposed by the National Curriculum Council (NCC, 1990), was being taught within the subject areas of Science and Humanities, especially the Biology and Geography departments. This was due to the overlapping of certain subjects within their individual programmes of study. The material not covered by these two subject areas was presented to the pupils in a variety of ways. These included a cross-curricular day, a whole school Environment Committee, recycling schemes and fund raising. The Environmental and Biology Society were a joint entity at this point in time, as there was one teacher (Biology specialist) responsible for them and the environmental policy of the school (section 2.5).

An audit was to be undertaken to determine the extent of environmental activity in each of the subject areas. In so far as evaluation of the progress of EE provision at the school, the policy maker stated that ' *We will know we have been successful in this when Environmental Awareness appears in all subjects in the school without continued repetitions... this will be tested by occasional questionnaires and observed in the extra curricular aspects of the school e.g. assemblies, magazines, societies, etc'.* There was no record of any questionnaires being carried out[4] and although environmental issues did come up in assemblies and society activities the EE coordinator did not have a record of these occurrences. The audit was not completed.

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[3] p12 case study school policy booklet 1996
[4] pers.comm. case study EE coordinator 03/12/98

In 1996 a new Environment Co-ordinator was appointed, as the post became vacant. The teacher, who took up the position, was a member of the Geography department, who had helped the previous post-holder on a number of occasions. She indicated strong feelings towards the particular relevance of her topic area in EE[5] and, during 1997, showed initial reluctance to talk freely about her stance or the state of EE at the school.

The Environment Club and Biology Society (detail of these in section 2.4) became separate entities during 1996, when I joined the Biology department at the case study school. The Geography teacher (responsible for EE co-ordination) wished to continue with the Environment Club in association with the Eco-Schools commitment (section 2.5). Initially there was some difficulty over the perceived domain of certain topics or activities. The Head of Science saw 'Environment' as a category within the umbrella heading of Biology and, indeed, he felt that I had a responsibility to spend time on environmental issues within BioSoc. However, this clashed with the aims of the Environment Club and it took a number of months for the teething problems to ease. After initial tension between the two departments communication was much improved and the atmosphere more congenial.

Communication between myself (a Biology teacher) and the EE coordinator continued to improve throughout the period of the research to the degree that it was possible for a taped interview to take place in 1999.

During the first autumn term of the new academic year (1996-7) a circular was sent to all departments that described the opportunity for the school to apply for a £6,000 award, available to assist schools develop the idea of sustainability in their curriculum. Each department filled in a slip that indicated whether they were in support of sustainable development and also to identify a key person in that department who would be the co-

[5] pers.comm. EE coordinator (casual conversations during 1996/7)

ordinator for that particular subject area. The cash award was offered by WWF under their Curriculum Management Award Scheme. Teaching staff and the new Head teacher (joined September 1996) did not support the project well enough and so the bid did not go ahead[6].

By 2000, following frequent, informal conversations, the EE co-ordinator was talking, enthusiastically, about ideas for EE, such as joint Biology-Geography department participation in events. A proposal in April 2001 was for these two departments to join forces in offering an EE trip to the 'Eden Project' in Cornwall, although, ultimately, this did not take place.

In September 2001 the PSHE schedule was changed so that only years 8, 9 and 10 would receive specific EE lessons, with all cross-curricular days ceasing. The lessons were designed and delivered by outside agencies from the local area. Both year 8 and year 10 undertook guided tasks by 'Earthkind' volunteers that could be followed up in a second lesson, looking at oil pollution in the local area. The year 9 pupils were to have a visit from a theatre company, which would explore the issue of Rainforest Destruction. Further changes are discussed in section 2.6.

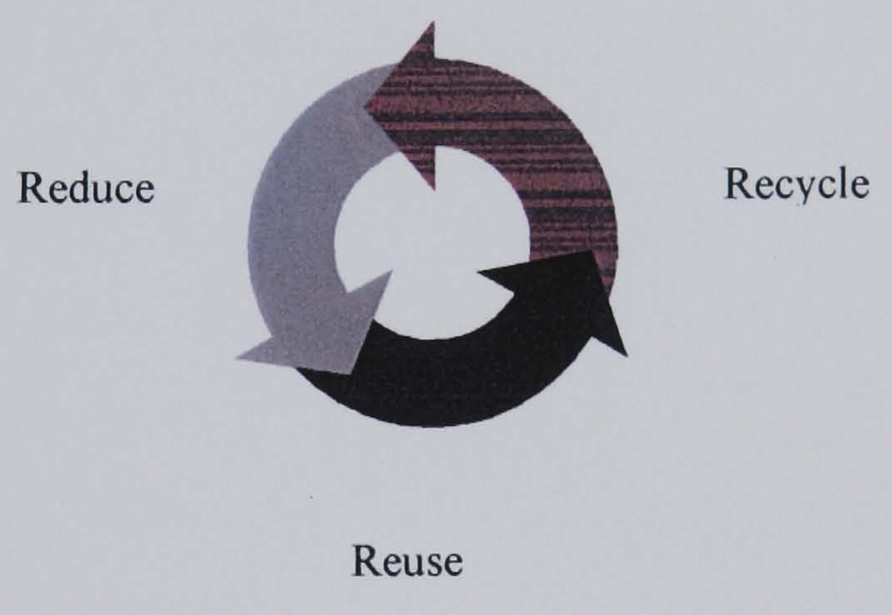
During 2001, the EE Coordinator resigned from this position. A Deputy PSHE Coordinator was appointed to aid the primary PSHE coordinator and ensure activities such as environmental competitions were offered to pupils; the current Head teacher (in interview chapter 5) made it clear that there would not be a designated position for an individual to write or coordinate EE materials.

[6] pers.comm. EE Coordinator 19/05/99

2.5 "Eco-Schools"

"Eco-Schools" was introduced to the school in the early part of 1996. This is a Europe-wide project which aims to raise pupils' awareness of environmental issues through classroom study, active participation by pupils and learning beyond the classroom into the community. Initially questionnaires were sent out to form groups who were asked to discuss *'... what they saw as the big environmental problems around school.'* (p2, ESAA, 1996). The areas that the EE coordinator decided were of most concern (those issues with the highest tallies[7]) formed the basis for the Action Plan. These concerns centred on recycling of a variety of materials, energy, paper wastage and litter. From this an Eco-Code was agreed on: 'Reduce, Reuse, Recycle', which went on to be written around a recycle logo (figure1).

Figure 1 – 3R's logo



The Eco-School Committee consisted of a representative from each form, three teaching staff and one member of the non-teaching staff. The meetings were held once a term, using a previously drawn up agenda, and minutes taken to provide a focus for implementation later on.

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[7] The author did not have access to the original questionnaires. Summary tally table in ESAA (1996)

All over the school small changes were made. An article was written by a year 11 pupil for the 1996 edition of the school magazine. It focused on the school achievement of the Eco-Schools Award, which was presented to them by the local Council. The Award manifested itself in the form of a flag and a certificate, both of which were displayed in the entrance hall. This status has subsequently lapsed. In order to qualify as an Eco-School, the case study school must meet particular criteria and re-apply, a task that was seen by the EE coordinator as burdensome, and unlikely to achieve sufficient support to occur.

2.6 Environmental education in school practice

Throughout 1996 and 1997 the school held EE cross-curricular days for pupils in Year 8 and Year 9. In Year 8 pupils were taken to a well known 'green' cosmetics and toiletries company's factory, where they were taken around on a tour of the premises using an activity booklet to steer them in the direction of questions and answers related to the sustainable practices of the company. This was a great success with the pupils, and not least because of the shopping opportunities at the end of the day!

In Year 9 pupils would stay at school but be taken off timetable for the whole day whilst they took part in a Sustainability Conference. This involved six speakers attending the conference from a variety of outside bodies such as Local Agenda 21, One World Trust and Travelwise. Initially the whole year group would hear a talk on Interdependence, then the pupils were split into groups of six and during the morning session each member would attend one of the talks on offer. During the individual talks pupils could take notes on the possible points for a school action plan and possible points for a home based action plan. Following this, the team members would regroup and feedback on what they had each heard, to their colleagues. Their task for the afternoon session was to make a poster for each action plan using the paper and pens provided to them. Finally to complete the day a judgement was made on the best posters in terms of presentation and content.

With the commencement of a new academic year and a changing of timetable amongst other things, the cross-curricular days were stopped and in 1998 PSHE lessons were begun. Each class within each year group was allocated one lesson per fortnight. Throughout the year there were a number of topics to be covered including Health, Revision Techniques and specialist topics for particular year groups for example UCAS lessons for Year 12. Table 2 illustrates the PSHE timetable for the academic year 1998-1999. The change led to a reduction in the EE provision to the younger age groups in the school. Years 8 and 9 lost time allocation and external community influences in their EE

experience. The tasks were now paper based and run by the form tutors, who may not have had much enthusiasm for the activity with which they were presented.

The Year 8 PSHE lessons consisted of an introductory session using cartoons based on environmental issues that allowed pupils to discuss in their groups their interpretation of the cartoons, followed by whole class discussion of the issues raised.

Table 2 - PSHE timetable for the academic year 1998/1999

	School term in the academic year 1998/99		
Year group	Autumn	Spring	Summer
8	2 lessons		2 lessons
9			1+ lessons
10	An Environment Day to be held off timetable		
11		2 lessons	
12	1 lesson	1 lesson	
13	4 lessons		

This discussion ended with the conclusion that, for positive changes to be seen, pupils should act on their concerns, and so the classes discussed things they could do, both at home and at school, that would be a step towards their participation in 'pro-environmental action'. An Eco-Schools representative was nominated and the roles of this person were discussed using the job description provided by the EE co-ordinator. The second part of the sessions was devoted to exploring the concept of sustainable development, finishing with the groups presenting their findings to the rest of the class. The Year 9 activity was similar in structure to the second Year 8 activity. The Year 10 day 'off timetable' did not take place. Year 11 PSHE EE focused on transport problems and looked to the pupils to respond to the varying political climate scenarios that were given to them. In both Year 12 and Year 13 the concept of sustainable development was explored in some depth. The bulk of the lesson time was spent reading information sheets and discussing as a class and in smaller groups. The final lesson involved presentations by the pupils. Each group focused on a particular topic such as Laundry or Fashion and within

this they concerned themselves with the choices available and possible changes to the current course of action. In 1999 the PSHE programme changed and Environment was to have, dramatically, far fewer lessons allocated to it (Table 3).

Table 3 - PSHE timetable for the academic year 1999/2000

	School term in the academic year 1999/2000		
Year group	Autumn	Spring	Summer
8	2 lessons	1 lesson	
9			
10	2 lessons		
11			
12			
13			

The environment content in Years 12 and 13 would now be covered in *General Studies* sessions. In addition to this, a *Resistant Materials* teacher used an environment-based project to teach his Yr 9 groups. The main project was named 'The Green Machine' in which groups of pupils worked over a period of weeks to produce a series of events and mechanisms that illustrated an environmental issue. This, and the designing and making of their own jewellery, encouraged the use of waste materials in order to show recycling as the heart of the projects. These projects were repeated with the rotating groups in Yr 9 so that all pupils had this experience once in their education at the case study school. Nevertheless, it is my opinion that this 'skin and bones' approach to EE cannot be supportive of the philosophy of EE.

During the first few weeks of the academic year 1999-2000, both Biology Society and Environment Club saw new members join until their memberships were quite healthy. A second Biology teacher joined me in running the Biology Society and, initially, Tuesday lunchtime meetings were spent discussing things the pupils would like to do. Their ideas ranged from trips out of school during lesson time to paid-for excursions during the weekends. The limitations to the opportunities were discussed and it was highlighted that

expenses were the responsibility of the pupils; this seemed to dampen their enthusiasm. Consequently, activities were focussed on that would be achievable in the lunchtime (50 minutes), and would involve participation by the girls in order to see an end result. Plans sent by DWT were used to make Bird and Bat boxes. Following discussions with a technology teacher and technician, it was agreed that the production of these boxes could be an immediate project for the pupils. The pupils, varying in attendance from 5 to 9 individuals, appeared keen and looked forward to putting the boxes up in the school reserve (reference to activity in sections 4.3.1 and 4.3.3).

In contrast, sixth form Environment Prefects, rather than teachers, ran the Environment Club. There was an initial meeting held in October 1999, at which point 9 Year 8 girls attended to listen to the sixth formers explain the activities that the Environment club would be involved in. One immediate move made by the sixth formers was to rename the club - *Earth Watch* - they hoped this would advertise the focus of the club to all pupils and lead to more membership. However, the club never really got off the ground and it soon folded up completely. BioSoc had infrequent meetings depending upon the level of interest demonstrated; these varied from activities for the pupils to undertake to speakers visiting the school to present material to the pupils.

The Eco-Schools meeting of academic year 2000-1 took place on Wednesday 22nd November 2000 and was attended by most class Environment Representatives. The main focus of the meeting was plants in classrooms, recycling, awareness and other items raised by pupils themselves; availability of organic food, charities, grass trampling at the gates, car use and smell from the nearby sewage works. The minutes, with comments from the EE Coordinator, were sent out to all Environment Representatives and these were to be read out to the members of their respective forms. No meeting was held in the spring term.

The academic year 2001-2 was very 'quiet' in terms of the EE provision to pupils in the case study school. Although Environment Representatives were voted into position

they did not have any meetings or activities to attend during the year. One of the Deputy Head teachers had carried out a survey in the previous year to gauge the successfulness of the PSHE programme. Within Yr 8, 9% of respondents reported having enjoyed the EE they experienced in the autumn term and 11% of respondents were looking forward to the further session in the spring term. The Yr 10 respondents did not recall EE as one of the topics they had enjoyed most in the autumn term. During an informal conversation (20/09/01), the EE coordinator commented on the changes she had made to the EE provision to try and make it more interactive for pupils rather than simply taking part in written and discussion tasks. The complete PSHE timetable was changed, the 2001-2 academic year EE provision can be seen in table 4.

This timetable was kept for the following year even though there was no particular individual responsible for EE in the school. The previous position holder had already organised the external speakers and so the activities remained the same with a view to changing in the academic year 2003-4.

There was an insignificant change from the previous provision in terms of time allocation. Without a coordinated approach from all departments across the school, this was the only confirmed EE provision and consequently, for some pupils, may have been their only access to EE. Although a positive aspect of the 'delivery' of the EE lessons was a return to involvement of external speakers the isolated activities lacked follow-ups and consequently failed to provide the pupils with long-term stimuli for lifestyle-changing learning (section 5.4.1.3).

Table 4 – PSHE EE timetable for the academic year 2001/2002

	School term in the academic year 2001/2		
Year group	Autumn	Spring	Summer
8			2 lessons led by external speaker
9			Interactive Theatre production[8]
10			2 lessons led by external speaker
11			
12			
13			

I have concerns over this approach. Rather than simply having a benign influence in EE, do these types of activities cultivate dismissive, possibly negative attitudes, in either pupils or teachers, towards EE and its provision?

[8] This was a stage presentation of rainforest degradation issues and questions were posed to the pupil audience at the end

2.7 Evaluation of school programmes

Evaluation within the institution itself is in the developmental stage. Meetings held by staff have highlighted the need to monitor and evaluate programmes underway in the school before further changes are made. The school staff hopes to see 'change for change's sake' avoided, and alterations to current practices implemented more readily as necessary[9]. Meetings set aside for evaluation of PSHE programmes, including EE, were taken over by organisational problems within the department[10]. Time for such meetings requires funding. This is a crucial factor and consequently evaluation of the current (at the time of writing) programmes has not taken place within the team. The EE co-ordinator took note of comments passed on to her informally by staff and pupils, and was trying to integrate their points, to some degree, for the following year. A single-side evaluative questionnaire was sent out in 1999 from the, then, Pastoral Deputy Head teacher to the year 8 tutors and the PSHE team, who had all delivered PSHE material. This asked 5 questions that required responses about the perceived effectiveness of the PSHE programme. The questionnaire was not received favourably. Two of the questions were unclear, teaching staff felt unclear as to what exactly was being asked of them, with one question alluding to their prior knowledge of the NC PSHE objectives. These were printed on the back of the questionnaire sheet and, in many cases, this was the first time the teacher had seen them. Consequently, the questionnaires were not found to be very useful in terms of evaluating the programme itself. Although the EE programme may have been implemented with a set number of objectives, these were transformed by the effect of programme interaction with staff and pupils. Due to the nature of the information being gathered, this case study does provide some 'depth' to pupil and staff evaluations of EE provision.

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[9] Staff Forum 29/06/99
[10] pers.comm. from a PSHE team member at the case study school 05/07/99

3 Review of Research Literature on Environmental Education

3.1 The need for Environmental Education

The requirement for public education about the environment, the actions taking place in the environment and their consequences gained great exposure when Rachel Carson wrote of the need for public awareness that would enable individuals to make informed choices:

> *'There is still very limited awareness of the nature of the threat. This is an era of specialists, each of whom sees his own problem and is unaware of or tolerant of the larger frame into which it fits... When the public protests... it is fed little tranquillising pills of half truth... It is the public that is being asked to assume the risks... The public must decide whether it wishes to continue on the present road, and it can do so only when in full possession of the facts.'*
>
> (p29 Carson.R, 1962)

Carson made it very clear in her book, *Silent Spring,* that all individuals in society should be making decisions on the fate of the environment and not entrusting it, without question, to politicians and scientific institutions alone. Throughout the 1960s environmental organisations grew in number and size. With this came improved levels of EE, more environmental information was being placed in the public domain. Although there was now a demand for more accessible and more organised public EE it did not come without its critics. Disinger (1997) reported on the criticisms made of EE in the USA. It seemed that there was confusion between EE and environmentalism; believing the aim of this type of education was to change individuals into radical environmental activists.

Research has suggested that advocates of the shift in societal worldview were more successful than had been imagined. The shift was from one of an economically progressive, science based ideology (that was linked to negative impacts on the environment) to one that rejected the environmental consumerism stance in favour of a

more mutually beneficial relationship between humans and the rest of their environment (Dunlap and Van Liere, 1978). So it seemed public attitudes towards their environment were changing, however, the authors continued with a caution:

'*... we fear some may draw overly optimistic conclusions about the future of public commitment to environmental quality given the surprising degree of public endorsement of the* [new worldview] *found in our study. Caution against doing so is suggested by a considerable body of social-psychological research on attitudes and their relationship to behaviour... it would be naïve to expect individuals who endorse the* [new worldview] *to consistently engage in behaviours congruent with this new world view. '*

(ibid, p 17)

Indeed, twelve years later, research conducted using a 'willingness to give up' scale, suggested that once individuals had to sacrifice certain personal behaviours to contribute to amelioration of environmental problems the worldview shift became less clear (Gigliotti, 1992). The message here was that individual concern about environmental issues had been successfully generated, but translating that into personal action did not seem so successful. Perhaps the link between environmental degradation and personal behaviour is not truly understood by individuals in society, consequently, change in action is seen as the responsibility of 'industry' that are, in the view of the public, the 'perpetrators' of negative environmental impact.

3.2 What is Environmental Education?

Within the secondary school level in Britain the broad objectives are universal. Umbrella statements are given in the NC (see section 1.2.2). For both male and female pupils, in the age range 8 – 11 years in English schools (i.e. up to Year 8) it has been shown, with some statistical significance, that education *through* the environment does have merit (Harvey, 1990). The findings of the study, suggested that 'complex' (not necessarily greener) school grounds could provide for more effective learning experiences, along with classroom preparation – providing for the *about* component of EE. However, this '*slogan system*' (p101, Robottom, 1987) allowed for the development of 'bolt on' EE that has shown itself in the form of increased quantity of environmental material, usually under the guise of science and geography, taught in the same manner as other curricular subjects. Robottom (1987) considers that this form of teaching has led to the barriers to education *for* the environment. Depending on the interpretation, *for* the environment, allows an educator to refer to actions of environmentally responsible behaviour. The predetermined desirable outcome stance negates, possibly, both objective 1 and 2 of the Tbilisi Declaration and is considered by some to be in opposition to the spirit of education itself (Jickling, 1992). However, the term *education for the environment* needs be clearly defined by the user, as in some cases it is used as a metaphor for a huge array of understandings, practices and positions, which may not be completely compatible or mutually exclusive (Fien, 2000), whilst in others it is taken literally and consequently can lead to many researchers being preoccupied with contestation of its use (Scott and Oulton, 1998, Jickling and Spork, 1998).

If individuals are told what the appropriate and acceptable behaviours are, they may not have the opportunity to develop autonomous thinking or understanding of environmental issues (Wals *et al,* 1997). In addition to this, by stating that education should be *for* the environment, policy makers are suggesting that humans are separate from

the environment and thus freeing them from environmental responses to their actions. This goes against much ecological teaching and is an unnecessary stance to take,

'The fact that human beings are organisms whose life and reproduction depends upon their interaction with organisms of other species, as well as with abiotic components of the environment, does not rule out the possibility that they are also aware of themselves as beings, who can relate to one another as subjects, and who can therefore on this intersubjective level – enjoy a distinctively social life.'

(pg 2, Ingold, 2000)

Breiting (1994) takes this further and suggests that EE should not be mainly *about* the environment, as this tends to put a subject label on it. Rather, the suggestion is that EE should be about,

'...environmental issues man faces through his use of natural resources and the possibilities to overcome and prevent them in the future.

(p6, Breiting, 1994)

One of the main differences between this form of EE and more established versions is that there is no denying the anthropocentric aspect. It is humans that are seen to be the cause of many environmental issues, arguing for preservation of environmental sites and species for their own sake removes humans as an aspect of the global community. Environmental education must take the stance of '*man-nature relationships as inseparable*' (p14, Breiting, 1994) if it is to develop concern for future generational effects.

Barry (1999) considers humans as separate from their environment but having a relationship to and with it. He justifies this by stating that *'... the 'natural environment' does not depend on humanity.'* (p17), that it is humans that depend on their environment; referring to processes that pre-date humanity and human society, such as carbon cycles. I disagree with that position. The environment is only what it is because of human involvement over millions of years, that is to say, the environment is dependent on human

interaction. Habgood (2002) considers that environment is a cultural as well as physical construct. Some human cultures have contributed to this construct by imposing themselves, physically, on the most extreme and 'human' free reaches of the earth (SCAR, 2000). If there was no human interaction, the environment would be quite different, it would exist, but not in its current state. Carbon cycles *per se*, would continue but the specifics and the conditions of those cycles would be quite different. This is a viewpoint echoed by Smyth (1995) and Ingold (2000), where the latter describes *'....organism plus environment...'* as an *'... indivisible totality...'*, with environment as a dynamic *process* that goes through *growth* and *development*.

Payne (1997, 1999, 2001) calls for an approach to EE he coins 'a critical ecological ontology'. Essentially he suggests that environmental educators should not rely on artificially contrived educational experiences such as a field trip or a case study in order to explore environmental issues. Alternatively, in line with what he describes as 'a duality of inner and outer natures', he suggests we concentrate on dealing with environmental issues from the inside first. This inner and outer nature is not dissimilar to the children's *inner and outer worlds* described by Lucey and Reay (2000) that, together, are important in the process of identity development. Payne would like to see EE approached in such a way that:

> *'....researchers, teachers and learners delve phenomenologically into the 'lived experience' and basic patterns of one's own day-day existence.'*
>
> (p 24, Payne, 1999)

The concept of personal reflection on ones own existence and critical analysis of each individual's contribution to the state of their environment, of which they are a 'non-separate' part, seems to complement the ideas expressed above. Payne (1999) rejects the notion of a Cartesian split being expounded by this theory; he also rejects the deep

ecological notion of 'holism'. Instead he argues that this duality reflects the connection that exists between self and nature:

*'The self, as a potentially responsible agent and accountable actor for one's 'own backyard', **for one's being**... ... .'*

(ibid, p 23)

This approach allows for the individual to have free will and act in a manner of their choosing. However, it tips its hat in recognition of the inability of the individual to carry out its actions in isolation of *other*; conscious of a reflexivity, a constant mutuality between one's inner and outer natures.

The call for a move towards an alternative approach to EE appears to be firmly part of the EE dispute. What is called for is an approach that returns to the responsibility, *active and interactive elements* of theory consistent with Dewey, Montessori, Piaget and Vygotsky (Mooney, 2000); elements of curriculum development that were internationally attempted within ENSI, the 'Environment and School Initiatives', in the late 1980s (Elliott, 1995).

The approach towards EE and EE research, as traditionally advocated, encourages an objective, individualist learning experience, whereby pupils are presented with the environmental 'facts', causes of issues and technological amelioration possibilities. This is clearly demonstrated in the use of terms such as *'ideal intervention program'* (Tung *et al*, 2002) and *'treatment impact'* (Knapp and Poff, 2001), when evaluating EE. There is an implicit assumption, in this type of research, that the pupil is *passive* (Rickinson, 2001); consequently, in this provision there is little room for values or collaborative participation. Pedagogical practices used to provide for EE across cultures and across generations may need to change to become more sensitive to the context of those populations and move away from the widely accepted scientific pedagogy currently used to determine curricula (Bowers, 2001).

Students' cognition of, and concern for, the environment may be increasing but not necessarily their ability to act on this concern or to change their behaviour (Ballantyne *et al*, 2001). Thapa (1999) found that the relation between concern for environment and environmentally responsible behaviour was weak in US college students (varying ages and courses). Pepper remarks that endless technological know-how cannot ensure that society will change its behaviour from the environmentally damaging mode that exists (pg x, Pratt, Howarth and Brady, 2000). The mechanistic approach to EE has not always been met with success. There is a need to appreciate that 'internal relations', the way an individual chooses to respond to the external influences, will affect outcome. The immediate environment of the student will have an influence on their response; we all behave differently in different environments (Birch, 1998), consequently, it is unlikely that EE can be standardised throughout a variety of educational environments (Hsu and Roth, 1998).

Education is a collection of subjects that are, themselves, made up of various aspects; for example within the teachings of EE pupils will be exposed to atmospheric chemistry, cultural and moral-ethical codes, population dynamics and so on. As with the *pure* sciences (Feyerabend, 1993) there is no common structure to the educational method to be used by educators. The educational method to be used will need to take into account the individuals involved, both the educator and the students (Ballantyne *et al*, 1998), as the approach taken by the individuals and the learning they experience can be very different indeed (Feyerabend, 1993).

Reiss and Tunnicliffe (2001) expand on this by discussing a variety of ways a biologist might approach scientific research in a wood habitat. They suggest that there is no <u>one</u> way to *see* the wood. A more postmodern view being that the <u>way</u> in which the wood is viewed, will be different depending on the individual doing the investigation. Environmental education 'outcome views' may differ, depending on the pupil involved. Twenty-eight pupils may start a lesson with twenty-eight completely different views on an

environmental issue, as a consequence of the factors that go to making up the view that the individual brings with them. The process of EE needs to respect this '*pluralism*' and enable pupils to respect it during discussion and conflict resolution (Lijmbach *et al*, 2002).

Fien *et al* (1993a) see EE as a professional practice that *'seeks to develop the understandings, values and* ***action skills*** *necessary for people to* ***work with others*** *to improve the quality and sustainability of their natural and social environments' (p vi).* The authors write that by EE providing experiences for lifelong learning, individuals can take the part of **active** citizens with the will to **act** against those activities seen as socially or ecologically unjust. So there is a form of societal reconstruction at the heart of EE, which, itself, poses many issues (Chapman, 1999). Wals *et al* (1990) define EE using the words *planning, participation, implementation, evaluation and resolving;* again, identifying learner participation as central to the process, these authors highlight that action, to ameliorate environmental problems, will be at the *local* level.

Most recently the curriculum has evolved to include the teaching of sustainable development. The definition of sustainable development is a hothouse of debate in itself, but the role education plays in its success is affirmed at the highest levels:

'Education is critical for promoting sustainable development and improving the capacity of people to address environment and development issues... it is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development.'

(UNESCO extract in Oxfam 1997)

Oxfam (1997) see the school environment as providing the setting for the development of children's sense of ***identity and self esteem.*** In order to go even part way to achieving these goals one must have an understanding of the factors influencing the development of sense of identity and sense of self, and what characteristics promote

motivation and excitement, towards the environment, in pupils of a school leaving age (see section 3.2).

The authors cited above identify educators and pupils working together on environmental issues. This partnership will only develop if educators go beyond active listening (Hutchinson, 1997) to developing true dialogue between the two parties. Freire (1993) sees the essence of dialogue as the word, and the word as an instrument that enables reflection and action, which transforms the world. Ideas cannot be deposited into, or consumed by, another individual; dialogue cannot be hostile or involve domination of one individual over another. '*...It's... arrogant to supply answers for other people.*' (p135, Lifton, 1993)

The individuals in dialogue must be equal; this refers to teacher and pupil. Freire also considers that there must be hope. Individuals involved in dialogue must feel that their efforts could be fruitful. In teaching students about environmental issues as social concerns, educators should be:

> '*... encouraging participation in democratic ways of expressing their opinions and understanding how society can act through legislature... there can be little point...* [in leaving]*... our students feeling depressed and powerless...* '
>
> (p382 Solomon, 1988)

If the individual feels there is no hope, *'What's the point?'*, there will not be true dialogue. True dialogue involves love for the world, humility, critical thinking, faith in others and mutual trust. Without dialogue there is a breakdown in communication, and communication is the linchpin of EE (Smyth, 1997).

Students are accessible vectors for transfer, and thus the magnification, of EE to the home situation. This may lead to empowerment of students and co-operation of the family members in carrying out responsible environmental behaviour (Ballantyne *et al,* 1998).

3.3 Research into the reality of Environmental Education

The reality of EE is not widely different across the globe. Research from Australia, America and Hong Kong, amongst others, suggest that the outcomes of EE provisions are far from satisfactory (Yeung, 1998; Connell *et al, 1999*; Gigliotti, 1990; Hungerford and Volk 1990; Tung *et al*, 2002). Evidence suggests that many people, when faced with the enormity of environmental issues, prefer to bury their heads in the sand. If the issue seems too much to bear, individuals may deny its existence or deal with the knowledge in a more fatalistic fashion (Gough, 1999b).

The dominant paradigm in EE (and EE research) is not consistent with the philosophy of EE (Robottom and Hart, 1993); and commitment to it is not compatible with environmental concern (Dunlap and Van Liere, 1984). The dominant, scientific, paradigm has its roots in 'The Enlightenment'. The empirical and mechanistic nature of the scientific approach encourages the view of man as apart from nature and fact as separate from value (Merchant, 1989; Huckle, 1996; Goldsmith, 1996; Gough, 1999a). This alienation or break in the affective connectivity of humans and the rest of the natural world many have contributed to the distress, frustration and pessimism expressed by young people in relation to global environmental projections (Connell *et al*, 1999; Eckersley, 1999). Due to the very fact that such emotions are generated in conjunction with EE, educators should be aware that this is not merely a cognitive matter. Cognitive development within EE may become so overwhelming that there comes a point when the student generates affective isolation as a coping mechanism (Rogers and Tough, 1996). Hicks and Bord (2001) reported on a study of first year undergraduate students taking an environmental issues based module. It seems that students entering onto the course many have a similar standpoint to those Year 8 pupils beginning life at the case study school:

'Many first year students arrive with what might be described as false hope or unrealistic optimism about the world, partly through lack of knowledge but also because they themselves have yet to be tempered by life.'

(ibid, p424)

They point to 'breaking the heart' of the individual in order that they can appreciate the 'bigger picture'. However, the language they use here, towards the end of their paper, does somewhat contradict their use of a quotation from Huckle they draw on earlier, when suggesting the approach of the teacher is crucial in facilitating successful EE:

'If we are not to overwhelm pupils with the world's problems, we should teach in a spirit of optimism. We should build environmental success stories into our curriculum and develop awareness of sources of hope in a world where new and appropriate technologies now offer liberation to all.'

(ibid, p424)

The exploration of feelings towards environment and environmental issues is a task that requires sensitivity. 'Breaking pupils' hearts' conjures up memories of 'old school' teachers smurking '*Forget everything you were taught at O Level... here's where the real science begins... at A Level we do it properly...* '. It is still possible to recall the frustration caused both upon entry into the secondary system and then movement onto 16+ studies. This approach in EE suggests the expert status of the educator in an area of education that is loaded with value-systems. Surely the breaking of previously held beliefs should be taken on by the pupils themselves in the light of developing EE, with this a true sense of empowerment could grow within each individual.

Hicks and Bord (2001) allude to the need for attention to empowerment when they summarise the dimensions that should be given equal provision within EE:

- cognitive
- affective

- action

In their study the students found that reflection on their EE was therapeutic, it helped them to understand their feelings and legitimise them in relation to others on the course. Students need to be provided with EE that encourages the exploration of the affective dimension but that also enables them to deal with both the positive and negative consequences of this exploration. Environmental education is often seen as the domain of the 'academic specialist' in many secondary schools, and those 'specialists' are quite often the geographers and biologists. Teachers, who do not fall into these two curriculum areas, feel ill equipped to facilitate EE. However, it is clear that identifying and providing EE as a purely cognitive dimension, is not adequate (Hsu and Roth, 1998). Educators need to be competent in skills regularly used in the delivery of PSHE (Personal, Social and Health Education) and religious education – teaching how to 'handle' emotions and dealing with questions bound up a human's very existence. Training restricted to knowledge-based disciplines does not necessarily prepare teachers for the cross-disciplinary characteristic of EE (Payne, 1999). Korenman and Wright (2000) refer to the constructivist model, whereby pupils develop understanding and assimilation of material through the use of *their pre-instructional concepts*. In order for the teacher to know what knowledge the pupil can integrate and build with, they must know from what platform the pupil is starting. What this means is that the educators must have an idea of the attitudes pupils already hold about, and towards, the environment and EE.

Wals *et al* (1990), discuss a model used to approach EE in Michigan schools whereby students followed a process that allowed them to plan educational activities and take responsibility for action to improve their community environment. In this process, the school identifies the shortcomings in their educational programme and school personnel discuss with the programme personnel how they can be addressed. In this way the school community takes ownership of the process and is much more willing to work towards a

common goal. The process involves the handing over of responsibility to the pupils and working with an open-ended curriculum.

Connell *et al* (1999) undertook a study to determine changes in attitudes, towards the environment, in upper secondary school children in the Asia-Pacific region. The authors found that the commonly cited sources of environmental information were the media and school. Within group situations it became apparent that first hand experience remained the most influential source of environmental information. The media was seen, by the students, as untrustworthy due to the need to sensationalise and view the story from one side, all aimed at the ratings. School experiences were recalled as satisfactory, but students commented on the missed opportunities across the curriculum.

The general response of the Australian study, from the groups interviewed suggested that school provided the *basics* of EE that was trustworthy and from which one could seek out more. However, the school education was condemned for the apparent restriction on EE due to subject area or individual teacher interest. Indeed, this is an area that Robottom (1987) highlights as vital for consideration when designing an EE process. He states that *'we* [should] *recognise that environmental issues serve certain self-interests, we should also recognise that all educational processes serve certain self-interests'.* Robottom refers to the conflicts that exist between the current educational system and the idealist EE process. Schools follow fairly rigid rules and regulations, both in the classroom and outside. There are problems associated with the provision of EE from a *cross-curricular 'approach'*, when the style best suited to its success, involving inquiry, critical analysis, exploration time, and inter-disciplinary means (Iozzi, 1989), are often beyond current teaching provisions. Education providers may need to consider that the more *socially-critical approach* can be effective in relation to environmental educators goals and hopes for successful provision (Hines *et al*, 1986) within the current curriculum (Stables and Scott, 2001).

Schools may see themselves as separate from the surrounding environment and community, in their functioning and therefore find it difficult to incorporate a, fundamentally, community based practice. It may be that teachers feel they lack the qualifications, time or resources to take a role in an EE process. Or perhaps they lack understanding of the nature and objectives of EE in terms of the potential changes in societal behaviour, and so leave it to be dealt with under a particular subject specialism, such as science (Fien *et al,* 1993a). Littledyke (1997) provides further evidence for the lack of a consistency in EE. He refers to a survey of primary managers and teachers in which the data points to *"...insufficient pragmatic management support and pressure to cover the National Curriculum..."* leaving EE *"at the status of personal concerns..."* (p641).

Posch (1993) described a number of hypotheses for the perceived lack of positive behaviour, from young people, towards the environment. One reason, which relates to some of the responses given by the pupils in this study, is that of *sociological conflict.* In this explanation he points out that individuals do not intentionally set out to destroy the environment, it is just an unfortunate consequence of a consumerist economy. In such a situation, individuals feel powerless to overcome the driving forces of politics and profit making. In addition to this factor, he sees market forces and competition regulating the interests of the population. Posch suggests that people see the environment as a collective property, wanting improvements and advantages offered by the environment but without adding to *their* own costs. The problem with the view of the environment as a collective property is that individuals may not accept the idea that others may be benefiting from it without paying towards it; so leaving a few individuals to pick up the costs. A paradox exists, whereby individuals are causing damage to the environment and yet calling for its conservation due to the consideration of the environment as free and without worth (economically).

As with Posch's (1993) work, Connell *et al* (1999) found that students believed that environmental problems stemmed from individuals' refusal to take responsibility for the effect they have on the environment, possibly leading to a change in the comfort and conveniences they experience at present *(individualistic framework)*. They suggested that individuals would only change when forced with a disaster. However, although the students in the Australian study held an individualistic framework for the causes of environmental problems they did not seem to include themselves in that framework. As with the pupils in this case study, they commented in the third person, demonstrating a transfer of responsibility to individuals other than themselves. Another common argument used by students in the Australian study was that alternative lifestyles were not available. Students wanted to see industry setting an example and providing the general public with other ways in which to go about their daily routine. So the call here is not for more education into the issues *per se*, but exposure to knowledge and resources that will provide the individuals with alternative lifestyle directions.

Eagles and Muffitt (1990) identified nine attitude groups towards animals that the pupils could hold: naturalistic, ecologistic, humanistic, moralistic, scientistic, aesthetic, utilitarian, dominionistic and negativistic, and they used a questionnaire to categorise the attitude of each participant according to this list. In this Canadian study, children (aged 12-14 years) who owned pets had statistically significantly higher levels of attitude scores in the humanistic and naturalistic and lower scores in the dominionistic and utilitarian. The authors suggested that it was reasonable to assume that those children that regarded their own pets as friends, and had an interest and affection for pets, would transfer this to wildlife; and potentially more widely to the conservation effort. This link between pet ownership and concern over wildlife issues is echoed in Prelle and Solomon (1996).

The four most frequent attitudes, in order, were humanistic, naturalistic, moralistic and ecologistic. At this point, the boys and girls seemed to have similar attitudes, the

authors suggested that any differences would occur after the age of 14. However, Thompson and Mintzes (2002) carried out attitudinal work with a marine conservation focus and found that across a wide age range (6 yrs to adult) '*...female subjects were significantly more moralistic and significantly less naturalistic and utilitarian than [our] male subjects.*' (p657).

Interestingly, there did not seem to be a significant attitude difference between children who went camping and those who did not. This appears to conflict with other research on the effect of camping on environmental attitudes (Iozzi, 1989). Perhaps the wide scale occurrence of camp participation in Canada (Eagles and Demare, 1999) removes a degree of autonomy and so the influence of external locus of control is being seen.

This could contradict the suggestion that direct contact with the environment is important in attitude development. However, Hazelworth and Wilson (1990) suggest the positive influence of outdoor camping on self-concept and development of internal locus of control in activities carried out in North America, a claim that has been repeated elsewhere (Palmberg and Kuru, 2000). The context of outdoor experience and the location of locus of control in the event of participation need to be made clear.

It is unlikely that a single unit or course run over a period of a year or less will achieve the goal of responsible environmental behaviour by individuals in society. Collaborative action by all individuals in society is of prime importance; this includes the action taken by businesses and how they are perceived by society. The Labour Prime Minister, Tony Blair, spoke at the CBI and Green Alliance Address in London on just this issue (Blair, 2000). He reported that 'environment' and business did not have exactly the same objectives but they should be able to work together, providing for both the environment and development. Mr Blair referred to business leaders, the public (consumers) and environmental groups forming a partnership to protect the environment.

This is a process that will require more understanding, more dialogue and an approach that shows appreciation of the urgency of the problems and vision for viable solutions.

Pupils at school are a captive audience who, if educated in an appropriate way (appropriate for them), will be able to cascade environmental information and attitudes to other members of their family, including the adults. Interview evidence in this study suggests it is the adults in the family that are deemed, by many pupils to have the ability to call for, and make, changes; successfully making their opinions heard by the institutions that can lead to change in society. Ballantyne *et al* (1998) suggest that intergenerational communication is a powerful tool in enabling:

- Pupils to develop the ability to inform and influence the action of others
- The strengthening of links between the pupils' environmental learning and action
- Adults to become exposed to environmental information and actions
- Pupils to become involved in decision making and action processes in their own home and in the community
- The support of families and the community in active involvement

This allows pupils to become more responsible as educators themselves. Collaboration with adults on a common local environmental problem can lead to improvement of self-esteem, motivation and achievement of the pupils, as well as improvement in the teaching approach and school-community relationship (Gallagher.J. and Hogan.K. 2000). It opens up the opportunity for a more conducive atmosphere for adults to learn from children as well as vice versa and for children to have their ideas, quite openly, discussed and considered as viable options. Respect for the other generation might improve and community action may well be magnified due to intergenerational cooperation. Gallagher and Hogan (2000) quote a village leader in Thailand to emphasis the potential of intergenerational learning as a motivator for real change in behaviour:

"People from the government have often come to our village to talk to us about our forests and we did not listen. Today, our children and our grandchildren came and talked to us and it is time that we listen."

(ibid, pg107)

3.4 Learning and Action

Most educationalists would agree with the definition of learning as *'... a relatively persistent change in an individual's* ***potential*** *behaviour due to experience'* (Fontana 1995). Educationalists hope to bring about some change in the individuals they teach. In the case of EE, a change may be in the form of increasing awareness of alternatives to current life choices; this change brought about may well then lead on to specific behavioural expression (thus it is only potential). As Fontana stresses, learning requires experience; it is not just a result of maturation. Consequently, the integration of EE into the existing school programme must take account of the requirement for exploration of current and potential practices. Educators cannot assume favourable changes in attitude and behaviour will come about just with increasing age and physical development. Humans as social agents cannot be treated, and predicted to act, as mechanistic objects. The term *predict* used widely in EE literature, is equivalent to *a best guess* based on particular knowledge and understandings. Individuals choose to make certain things happen throughout most of their life; they are not, passively, being *acted on* by their environment. Once the individual's capacity to think, their ability to use self-governed rules in determining behaviour, is conceded, the ability to *predict* behaviour becomes less precise (Foxall, 1999).

'... Social behaviour is meaningful behaviour. It involves an agent with certain intentions and expectations, an agent capable of deliberating and choosing from a variety of courses of action, and whose words and actions are understood by his fellows. A central part of this whole process is communication between people.'

(p35, Harré and Secord, 1972)

'He is, if you like, the efficient cause of his own action...He takes care of the meaning of his acts.'

(p38, Harré and Secord, 1972)

Efficient causes are those with 'knock-on effects', the 'he' in this case being the pathway, the choices to the action; the action is not determined by 'final cause' alone (Habgood, 2002). Both Harré and Secord (1972) and Habgood (2002) consider that, in looking at human action, reducing an action down to its physiological steps can serve a purpose in some contexts but in others it is the overall, the 'whole', action that needs to be considered in order for the behaviour to make any sense.

Learners are exposed to new stimuli, which are internalised and integrated with existing units of understanding. The individual will become increasingly autonomous and actually affect the stimuli thus taking control of their learning. Consequently, individuals can chose to ignore stimuli or alter the interpretation of a stimulus in order to fit in with existing cognitive patterns (such as ambition). This is action on the part of the individual rather than movement or change in purely physiological terms.

Bruner (1974) suggests that the child goes through three stages of developing cognitive ability to the mature adult, *Enactive* (thinking based upon doing), *Iconic* (imagery) and *Symbolic* (includes language). Although Piaget and Vygotsky suggest similar 'levels' in cognitive development, Bruner proposes that the adult continues to use all of these three stages (Piaget and Vygotsky suggest that individuals move, irrevocably, from one level to the next). The significance of this being that, as pupils develop into adults, the participatory aspect of learning may remain highly influential in their values and attitude development with respect to the environment. The potential over-reliance on conceptual rather than participatory learning by educators of adolescents will be returned to in the discussion of the case study data (Chapters 4 and 5).

Vygotsky (1978) does describe how children's mental abilities are not set solely by psychological structure, but are influenced by the guidance and opportunities provided by adults. Consequently, children may move from a similar level of mental ability at one age and respond differently to their environment such that they develop to differing levels. This

difference in development, due to the response to guidance, was described as *"... the zone of proximal development... the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers."* (ibid, p86)

This development, that currently requires adult guidance, is in the process of maturing (prospective) and is indicating the future developmental capabilities of the child. Vygotsky goes on to state that: *"... learning... creates the zone of proximal development... awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers."* (ibid, p90). In his opinion, learning is not the same as development but it is a necessity for development; the development processes lag behind those of learning. By learning or acquiring new concepts, the child's development is in progress but is most certainly not completed. This participatory aspect to learning may explain the reason for the lack of success seen in EE programmes (Gigliotti, 1990 and Wals et al, 1997). Environmental education may not be met by promoting knowledge acquisition in a sterile setting such as the classroom; educators may need to be promoting the active education of students in a local context, working with a variety of individuals from their social environment including adults from both within and outside school (Mordock and Krasny, 2001).

Pupils in this case study identified the same issue raised by Gigliotti – individuals need skills education so they can take action to alleviate environmental problems. The term action is being used in the broadest sense to include that which would be considered civic and that considered strictly 'environmental' in nature.

In addition to a contextual setting for EE, educators need to consider the complaints being voiced; individuals need to be given *viable* alternatives to the proposed

unsatisfactory, or undesirable, aspects of society. Posch (1993) highlights that fact that a deficiency of viable alternative visions is probably one of the most dangerous stumbling blocks in effective EE. He points out that change in behaviour may be seen if EE is linked to change-oriented action and not simply to acquisition of knowledge and attitudes. Educators, and those individuals directing the educators, advocate the teaching of sustainable development. However, the teaching itself needs to be sustainable; providing positive alternatives that students and educators can explore and develop.

Environmental education ideals have much in common with *Transformative Learning Theory* (Mezirow, 1997), with critical analysis of one's own experiences, beliefs and values through discourse resulting in action on that reflection. Unlike more simplistic definitions, this acknowledges the contribution of conative and emotion factors in the learning process. It is likely that the EE pupils receive, contributes to *secondary emotions* (Arendal, 2000) within them, starting with a cognitive pathway, before going on to the amygdala, allowing them to make decisions based on events that are not immediately life-threatening. The conative component, connecting cognitive and emotion factors, is vital for pupils to become *'... successfully engage[d] in self-direction and self-regulation... '* (Huitt, 1999).

3.5 Adolescence and Identity development

Pupils at the case study school move through, potentially, one of the most turbulent times of their lives as they progress from Year 8 to Year 11 - *Adolescence*. Prominent assertions of adolescence (Raby, 2002) are used in this study to discuss the complex interactions of processes that contribute to this period in the pupils' lives, a consequence of the historical placement of the pupils – in a 21st century western culture.

The development of identity and self will be strong factors in determining the level of motivation or the affective response during an EE programme. There is some evidence to show that peer influence, especially related to 'antisocial behaviour', peaks at around the 9th grade (USA studies) and that emotional state (the threat of negative feelings), is enough to motivate acquiescence to behaviours considered antisocial (Lashbrook, 2000). Factors that will affect all the pupils to a similar degree within the cohorts studied are age and gender, however, social background is an uncontrollable factor affecting each pupil to a varying degree. It is difficult, as their teacher, to gain any detailed information on this latter factor; there are codes of conduct to protect the pupil-teacher relationship. However, often the social background will emerge when analysing the responses from individuals in conjunction with direct contact with the pupils. This knowledge about the pupils comes from contact in both pastoral and academic situations.

There are a number of influences on learning for any individual. In this case study some of these factors were controlled, such as the age and the sex of the pupils in the cohorts. The initial level of intelligence and information processing would have been *similar* for the pupils as they all sit an entrance test. However, these latter two factors show some disparity between individuals once they have started at the school. This disparity increases as they progress through school and written works testify to its existence (external and internal examinations scores).

Curriculum provision requires that pupils develop their moral code (Moon, 2001), and EE requires that they explore it (See Chapter 1). Moral orientation may be closely linked with self-definition; a sense of self, the particular way of 'seeing', that is going to influence one's moral approach. A major development that is occurring during the course of the study with every cohort of girls, a characteristic of adolescence, is that of acquiring a sense of identity. Consequently, self and identity must be considered along with moral development in order to go some way to understanding what may be contributing to the pupils' responses in this case study. The importance of a more explicit understanding of the concept of identity, and influences on its development in relation to EE, is reiterated by other researchers (Dillon *et al*, 1999, 2001).

Two words have been used that need further comment, 'self' and 'identity'. Ashmore and Jussim (1997) consider that these are not simple concepts:

'... there is not a single self or identity construct/variable. Instead there are a wide variety of self- and identity-related phenomena and terms to label these.'

(ibid, p5)

To elaborate:

'The self (the "I") is that aspect of the person that experiences, reflects on experience, and acts upon self-understandings that are derived from experience... The self is aware of and can behave in terms of a self or an identity (the "me" a more specific understanding of oneself as a woman or a professor, for example)

(p129, Thoits and Virshup, 1997)

with 'I' being classified as the subjective component of self, *'... self-as-knower... '* and the 'Me' composed of attributes that contribute to self, *'... self-as-known... '* (p47, Herman , 2001).

Harré (1999) provides a clear description of what it is to have a sense of self, that is *'... a sense of having a location in space, a moral position in relation to other persons, a*

social standing in relation to other persons, and of having a life trajectory in time... '(p58). Thus identifying the connectedness of the individual with that 'outside' by means of spatial, temporal, internal and external social dialogue.

Aspects of this sense may vary with culture and history, some will be more labile that others. The phenomena exist at the individual, personal level and at the social level. At the individual level there is differentiation between the subjective-self and the objective-self, with self-identity as representation of the assembly of the various 'statements' produced by the individual about themselves. At the social level the representation of the internal assembly of the individual, the self-identity, is developed in a cultural context. The identity of an individual can be a self-description or it can be a connection made with others in a particular sub-section of society, these are the individual and collective identities, respectively (Thoits and Virshup, 1997).

It is likely that individual and collective identities are not mutually exclusive, together making up the 'whole-identity' of a particular human being. Although these two identities may not be mutually exclusive, it may be that certain behaviours are consistent with one identity and not the other. The situational (spatial-temporal) context may determine which identity is more dominant and thus contribute to the eventual expression of a particular behaviour (Wetherell and Maybin, 1996). This takes into account the "*...duality of the concept of identity...*" (p 397, Dillon *et al* 1999), the individual needs to come to terms with themselves as they develop, as well as feeling part of a community that has come to terms with it's own path. In developing a sense of identity, individuals not only incorporate external influence but also contribute to it. Pupils in the school will be influenced by their school environment and in return will help to shape this institution of modernity:

'The self is not a passive entity, determined by external influences; in forging their self-identities, no matter how local their specific contexts of action, individuals contribute to

and directly promote social influences that are global in their consequences and implications.'

(p2, Giddens, 1991)

Head defines identity development as '*... the process of making choices which allow one to live effectively as an adult... '* (p9, 1997). Identity is a dynamic entity that is evolving through time - due to the dynamic qualities of society (Head, 1997; Lifton, 1993). This ability to evolve is somewhat like the poststructuralist theory that *'... identities are constantly becoming... '* (p221, Zembylas, 2003), but without implying that identities are, consequently, never complete.

Giddens (1991) and others (Kitwood, 1977; Lifton, 1993) consider that the 'disembedding mechanisms', characteristic of modernity's development, have changed daily life such that society is a 'global village' with shared institutional traits which are visible in the materialistic and consumer driven actions of societies. This globalization of the reach of society means that distant occurrences can have an influence on local incidents, so that the effect may be on the self. Herman (2001) considers the *'... dialogical self... '* (p54) may be a way that individuals adapt to this changing, unpredictable world in which the self is at once continuous and fragmented.

Indeed, Solomon (1997) referred to women teachers at in-service training sessions demonstrating *'... a conscious search for a new identity to fit another phase in their lives... '* (p414). Identity formation takes place during childhood and adulthood, but adolescence does seem to be the time of prime concern.

Head (1985) uses adapted versions of Marcia's identity statuses to provide a theory for the alternative routes taken to identity achievement. He suggests that there are four identity statuses possible for an individual:

a) Identity achievement (IA)

b) Identity diffusion (ID)

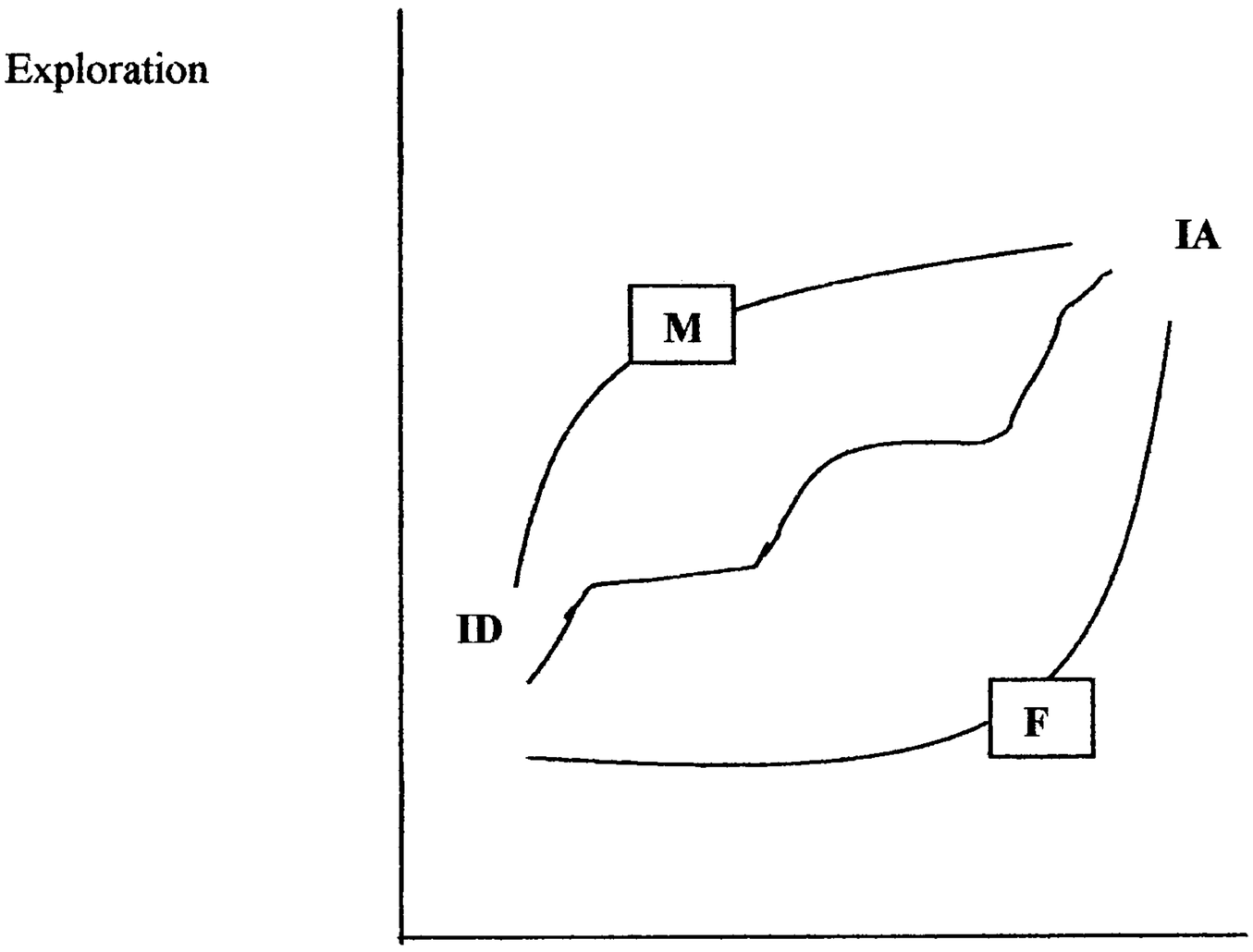
c) Moratorium (M)

d) Foreclosure (F)

b) and c) are possible resting states before reaching a) (Figure 2, from Head, 1985)

If individuals exist in the state of Identity diffusion, they have shown no evidence of trying, or making, any commitments within spheres of their personal life (Roker and Banks, 1993).

Figure 2 – Head's Identity status'



Individuals may not seem to have any problems moving through puberty and develop into young adults with clear ideas on who they are, where they want to be and why. At this point they are said to have reached Identity Achievement. However, there are two further routes to identity development that have been suggested. One, Moratorium, requires much soul searching and thinking about life decisions, to the point that decisions are postponed – a state of 'crisis' (Roker and Banks, 1993). The other route, Foreclosure, involves the avoidance of self-examination, the individual will readily take on the views and aspirations of those around them leading to an individual who is quite rigid in their thinking. The

question that individuals are evading is *'Who am I?'*. Peer group becomes very important and there is a degree of restriction on the type of person an individual wants to be due to the desire to conform to the peer group norms (Solomon 1997; Head 1995, 1997). By falling in with the social norm of the peer group, the individual gives justification to the image they project and thus the person they are perceived to be. Rorty (1991) describes this justification as giving sense to their lives:

> *'... reflective human beings try, by placing their lives in a larger context, to give sense to those lives. The first is by telling the story of their contribution to a community... The second way is to describe themselves as standing in immediate relation to a nonhuman reality... the former kind exemplify the desire for solidarity... the latter kind the desire for objectivity. Insofar as a person is seeking solidarity, she does not ask about the relation between the practices of the chosen community and something outside that community. Insofar as she seeks objectivity, she distances herself from the actual persons around her not by thinking of herself as a member of some other real or imaginary group, but rather by attaching herself to something which can be described as without reference to any particular human beings.'* *(p.21)*

Environmental education approaches will need to take into account these two different ways to justify the identity projected by the individual. Approaches taken to encourage desirable environmental behaviour may need to differ, depending on whether the individual emphasises the importance of solidarity or individuality. The educator needs to be aware of 'where the students are' to start with (Payne, 2001), as assumptions made about the student's position at this point in the education process can pre-determine the success or otherwise of the educational experience. In trying to understand why individuals behave as they do, *'... it is important to recognise not just the importance of the influence of the environment, but also to focus on the agency of the person concerned'* (p397, Dillon *et al*, 1999).

The educator needs to take account of the continuously evolving, personal identity of the individual. The challenge, in EE, lies in encouraging the development of more environmentally responsible behaviours from individuals that show commitment to solidarity, as change needs to be seen in the majority of the social group in order to effect a cascade type reaction to others in the group. Although *'... in an all-girl school the need to express solidarity with females is far less compelling'* with respect to choosing to study physical sciences (Solomon 1997), this is not the case with the need to express solidarity with a particular social group, when faced with social life choices that are directly linked to environmental degradation (see section 6.4.1).

The individual has a number of defining 'life' choices to make towards development of their identity allowing them to function autonomously and identifying solidarity with ideas. This may involve consumerism as a means of projecting this identity (Head 1997, Dillon et al 1999). These include the areas of sexuality, ideology and career. The experiences that are provided to the individual through various forms of media will contribute to the constant re-visioning of an individual's self-identity so that coherence is maintained in the light of revised 'biographical narratives':

'... lifestyle choice is increasingly important in the constitution of self-identity and daily activity.'

(p5, Giddens, 1991)

Head's model may be useful to EE, by incorporating the route the individual takes towards identity development in the education process itself. If we can identify the route the individual is taking towards becoming a more mature and reflective thinker, we might adapt the EE process in order to be most effective at promoting positive behavioural change. Alternatively, should we be looking at offering activities, in school, that will draw individuals from any route and help them in their movement towards identity development and locus of control orientation?

Although written from a very male-oriented perspective, Erikson (1968) referred to the importance of relationships in women's development of, and sense of identity. This characteristic was echoed by Gilligan's work. As individuals move through the period of adolescence there is bound to be a degree of tension between them and adults. Adolescents want to develop more autonomy and to have this recognised by the adults, whereas the adults may well have difficulty in 'letting go', this will be influenced by the existing 'myths' relating to both groups (Head 1997). The crisis of identity is due to the interaction taking place between the individual and the social parts of the whole. In Britain, Head sees a number of factors affecting this tense situation:

- Increasing extension of the period of adolescence
- Social separation of adults and adolescents
- Increasing unease of developing adolescents in talking to adults

A recent study in Britain outlined the level of disaffection felt by adolescents of both sexes (Scales and Taplin, 2001). Nevertheless, pupils still evaluate what adults say, and Head describes three tasks adults face in the development of identity in adolescents:

- Encouragement to move on from moratorium
- Providing the information to enable adolescents to make choices
- Stimulation to active thinking and decision making

Salzman (1990) considers that parents may remain a key component in the development of self-identity in adolescents. His study showed that attachment to the parents would remain, no matter what pain must be borne in order to do so; and it appears to be fully functional during adolescence for most girls. Conflict resolution was mentioned in Chapter 1 as an important skill pupils need to acquire in order to deal with controversial issues that manifest themselves as environmental concerns. The study that Salzman referred to highlights a hurdle with respect to the acquisition and practice of this skill. Acquiescence to parental influence on expression of particular environmental attitudes or

environmentally favourable actions, is identified by pupils in this case study (see sections 5.2.2. & 5.2.7. & 5.4.1.2.)

The social context creates a requirement of the adolescent, one that is generated due to the multiplicity of contextual roles played by the individual. This requirement is to *'...create multiple selves...'* (p85, Harter, 1997). One of the varieties of selves is then projected depending on the social context, such as interaction with teacher or close friend. This is not in complete contradiction to research, carried out with adolescent girls (Gilligan, 1993; Gilligan *et al*, 1990) that describes the inhibition of the girls' 'true-selves', brought about as a consequence of wanting to please others, having no faith in the perceived value of their contributions or by the apprehension of the 'anxiety-potential' of their contributions within relationships. The research carried out by Harter (1997), in relation to 'loss of voice' in adolescent girls, was done so with a quite different approach to that associated with Gilligan. Harter and colleagues used pen and paper 'instruments' on which pupils could select the most appropriate descriptions of self from the provided options. This took away the ability for individuals to express themselves more personally and subjectively, which is, after all, a premise of the task. In addition to this, the data collection had not been carried out longitudinally, allowing individuals to reflect on their 'self' in retrospect. Although, much of that research revealed a lack of support for a gender difference in 'loss of voice', they did find that level of voice differed in individuals. It was surmised that low-level voice girls who also had issues about appearance were at greatest risk from suffering *'low self-esteem and depressed affect'* (p97). It is likely that there will be degrees of level of voice that result in degrees of suppression of self, not simply the existence of an absolute loss of voice and consequently *'....serious suppression of self.'* (p100). The message here is to take care in making large-scale generalisations from small scale detailed studies.

This case study looks at secondary school-age girls and the changes seen in them during a turbulent time of their lives. It is necessary to consider more specific feminist literature in order to view adolescent theory with consideration to the lack of attention to girls or women seen in the majority of research.

3.6 Moral development – Feminist Literature

Morality can be thought of as social codification, a system, founded on reason, which has a governing effect over individuals in such a way as to limit harm or evil. In order for this system to apply to anyone they must regard themselves as a member of society; they must understand the system and it must be rational for them to use it in making decisions or judgements. In acting on decisions and choices we are exerting moral effects, we are acting as moral agents. This system can be treated as internal (subjective), that is part of the individual's personal code or as external (objective), that is imposed by society, from the attitudes and behaviour held by the cultural group to which the individual belongs (Fontana 1995). This system includes moral rules, moral codes and moral values. These factors may be formal and widely accepted (universal) or they may be informal, developed to deal with situations as they arise due to difficulties in reaching society consensus over an issue, for example abortion. The moral rules and codes of a society may not have the support of law, nevertheless, members of the cultural group who perceive themselves, and are perceived by others, as responsible see these characteristics as vital in the functioning of the society. Interpretation of factors such as moral rules and the scope of application of the moral system can differ from one society to another. The fact that differences, in the rules themselves, exist supports the idea that there is a universal human trait that allows us to distinguish between right and wrong, good and bad:

> *'.....people are good at detecting cheaters and are **fitted** with moralistic emotions that prompt them to punish the cheaters and reward the cooperators.'*
>
> (p504, Pinker, 1998)

but that social structures and interpretations made, can lead to variations in behaviour. So, although humans have a built in capacity for judgement of justice, the values applied to their moral system are not innate. Innate is used, in this instance, as opposite to learnt (Dawkins, 1986); that is to say, provided the individual received the basic requirements for

survival, the trait (values of *some* moral system) would develop (Evans, 2001). The individual did not have to learn about this phenomenon of morality, but it is not developmentally fixed, as this would presuppose fixed values of a moral system between cultures, and as previously stated this does not hold.

From the day of their birth, individuals live in a climate of morals and values (Kitwood, 1977). Fontana states that '*... morals and values are* ***largely learnt structures****, with young children acquiring them initially from parents and later from teachers, peer groups, the media, and society generally.*' (pg 238). He points to Freud and the theory that super-ego (inculcation of community moral code) is responsible for the morals and attitudes held by a child. The moral codes and strictures are so internalised by the child that the individual no longer sees them as originating from the parents. These codes are then not seen as a set of parental rules but, rather, a conscience that they have developed themselves and that acts in both aspects of morality (objective and subjective). Freud saw the development of the super-ego as necessary if the individual was going to 'act correctly' without the need for perpetual instruction from others, such as parents.

Although his research was carried out primarily on males, Kohlberg (1981) identified the importance of social interaction for the development of morality. However, he did not find many individuals who had reached the highest levels, in his investigations (Fontana, 1997; Barger, 2000) and this has brought doubt on the universal existence of the stages he described and, consequently, the gender differences to which he ascribed:

> '*....Stage 6 may simply be an advanced form of Stage 5... Stages 5 and 6 are very culture dependent, and are not normally reached in cultures which do not practice or teach a post-conventional morality.*'
>
> (pg 242 Fontana, 1997)

Furth (1980) took Piaget's theory as a general paradigm and identified stages through which the child developed; outlining a final stage in development, involving abstract principles, much like that of Kohlberg. However, values and codes built up during moral development are influenced by culture (Pinker, 1998) and, consequently, moral development is contextual, rather than abstract.

In games, boys are more concerned with the rules; girls are more concerned with relationships, often at the expense of the game itself (Gilligan, 1993). So the female approach to justice is that of relationship logic rather than fairness logic. Sensitivity to the needs of others and the assumption of responsibility for taking care lead to women attending to others and to include in their judgment, others' points of view. This greater capacity for empathy may be 'hardwired' into the *female* brain (Baron-Cohen, 2003).

With psychologists accepting men as the norm (Gilligan, 1993), any deviation by women in studies has been 'written off' as something wrong with the women. Research has suggested that women seem to have a problem with competitive achievement; they perceive a conflict between femininity and success. Gilligan suggests that this is because women perceive negative consequences associated with success such as threat of social rejection and loss of femininity. Another theory about this conflict is that women perceive something bad about considering success in terms of the better grades achieved by an individual, compared to others. This anxiety was certainly expressed by two of the four main secondary key informants (see section 5.2.7 g&h).

Merchant (1996) remarked that women in Australia show more concern for environmental issues than men and greater support for environmental and political issues than men; consequently, they are at the forefront of environmental activism. However, she comments on characteristics of women in Australia that may contribute to this show of strength:

- Their work is heavily focussed on care giving, service and volunteer activities
- Australian women contribute to 70% of individuals with incomes below the poverty line

Consequently, these women are at the front of the queue for receiving the effects of environmental pollution with consequences for their health and welfare. These characteristics are not true for the case study pupils.

However, as maturity is equated with autonomy, these characteristics are seen as a weakness in women. The very characteristics that mark women as caring and sensitive mark them as lacking in moral development. As Kohlberg's six stages describing the development of moral judgment are based on studies with males, women do not reach very far up his stages. Due to their emphasis of care about others rather than 'rules', women would not reach the highest more abstract stages of moral development. They would be lower down in the subjective, interpersonal stages. Thus, caring for others making them morally less developed. When concerned with the activity of care, moral development centers on the understanding of responsibility and relationships (female tendency); when concerned with justice, moral development is centered on understanding rights and rules (male tendency).

Gilligan's research (1993) suggests that the relationship between self and other differs in the experience of males and females. Males held different 'truths' to females. The males included in her research saw separation as empowering the self, whereas the females saw attachment as creating and sustaining the community. When describing themselves, the men in the study generally recounted their achievements and qualifications, whereas the women defined themselves in terms of relationships and responsibilities they held. The men had looked on identity of the self as detached and

objective in classification whilst the women had seen it in relation to attachments they had with other individuals.

The distance set up by the males, in seeing themselves in isolation to others and developing identity by gaining power through this separation, is to be bridged by intimacy that they will achieve in the experience of relationships. Isolation is ended and indifference is avoided allowing the development of concern for others. For men, it is intimacy that leads to the progression from adolescence to adulthood that involves adult love, moving the individual up through Erikson's scheme of moral development, previously mentioned. However, with the females, identity is defined by the relationships they hold. Fundamentally, the movement from adolescence to adulthood involves the same predicament, the conflict between integrity and care. However, the approach is different for the two genders. Females approach with the ethic of care (attachment) whilst the males approach with the ethic of rights (separation). Both the males and females reach maturity, via slightly different routes. In general, men will experience intimacy in relationships formed and this will affect the way in which moral problems are viewed in such a way that males will show concern for individuals and not just concern with fairness. Females, generally, move from absolutes of concern with care to the recognition that prevention of hurt relates to themselves, as well as others, so showing the need for equality of rights. Males become open to the fact that fairness cannot exist in absolutes and females become open to the fact that care cannot exist without context, so both genders move towards adult maturity, it is their pathway to this point that differs.

The convergence of men and women to a similar moral standpoint leads to both sexes understanding that judgment is contextual; this reduction in gender significance and the importance of contextual nature of moral reasoning in young adults is supported in Ryan *et al's* study of Australian undergraduates (2004). These findings were gathered at a particular moment in history, the sample was small, and the women were not selected to

represent a larger population. Nevertheless, awareness of these differing approaches to adolescence has consequences in EE, a values education, whose provision in school will need to accommodate the moral approaches taken by students. In engaging students with this type of education, the pedagogical approach should be sensitive to the fact that:

'... the time between childhood and adulthood is articulated through two different moralities whose complementarity is the discovery of maturity.'

(p 165, Gilligan, 1993)

This different construction of the moral problem by women may be the critical reason why they fail to progress through Kohlberg's stages. The psychology of women that has consistently been described as distinctive in its greater orientation toward relationships and interdependence implies a more contextual mode of judgment and a different moral understanding, which is grounded in caring (Gilligan, 1988, Collings and Smithers 1984, Wingfield and Haste 1987, Solomon and Harrison 1991).

Individuals who fight for the rights of Native Peoples and are deeply concerned with the damage to the earth's environments for future generations (dark green) demonstrate the higher levels of moral development. These individuals hold universal principles of justice towards other humans; they have developed a basic premise of respect for other humans that is the ends and not the means. In the process, laws are questioned and rejected if found lacking in support of the abstract, personal principles.

Teaching environmental issues in a factual (scientific) knowledge transfer approach will reduce, even remove, the possibility of student exposure to moral conflict. Kohlberg believed that moral conflict was necessary to encourage movement of individuals up (his) moral scale (Barger, 2000). The lack of application to environmental concerns by adolescents and the comments they make such as:

'I try to do what I can for the environment'

'Why should I be the only one to do something about it?'

suggest emphasis on conformity with societal conventions (not necessarily pro-environmental) and even individualism. In the absence of conflict perhaps higher levels of morality are unobtainable. Giddens (1991) suggests that, as a consequence of modernity, there is a tendency for every day life to become distanced from 'original nature' and its experiences; consequently the moral issues linked to those experiences do not touch individuals' lives. So lack of social moral conflict and an absence of relationship with non-human environment may contribute to the lower level moral stance taken by individuals towards environment and environmental issues. And yet, because of the 'human dominant' approach to nature and the resulting ecological issues, individuals are never more in need of moral consciousness in their 'life choices'.

A student taking up a position of responsibility within an environmental society or club may, on the surface seem like a selfless act. However the, now all too common, signal of their true nature is revealed with the question:

'Do I get a badge for this ?' or

'Do I get a credit?'

The point here is that the student does not reach very high up the moral development stages, personal gratification seemed to be of importance not the implication of the position of responsibility they were accepting.

Adolescent girls, like most women, will focus on relationships and the feelings of others. Conformity due to peer pressure will have the effect of situating the individuals lower down in the moral development scale. Nevertheless, if one considers the tendency of females is to focus on caring one can link aspects of the lower levels thus reached, with components of stage 5, where individuals demonstrate genuine interest in the welfare of others. The important consideration here is the focus of care; there is a relationship set up between the caregiver and the care-receiver.

With EE being provided in an objective (scientific) form, individuals do not explore their relationship with the environment and thus, on the female scale, the placing of environmental issues will be quite low compared to more identifiably 'human-relationship' issues. It may be this severing of environmental from human that hinders the development of moral values and codes directly related to environment.

In relation to concepts of self and morality, Gilligan's (1982) study of women at an abortion clinic identified a number of women who referred to not wanting to hurt others. They felt that conflicts should be solved without anyone getting hurt and defined the moral person as one who helps others, if possible, without sacrificing oneself. They used the words *selfish* and *responsible* in talking about moral conflict – contrasting with Kohlberg's male oriented stage descriptions. The women had the right to choose to have an abortion, but this was seen to be in conflict with the conventions of femininity and responsibility; a contrast to the independent assertion in judgment and action (the mark of adulthood). The female individual needed support from a female community in the decision-making task.

Using interview evidence, Gilligan described a sequence of change in thinking by women that went from

- an initial focus on caring for the self (ensuring survival, morality is a matter of sanctions imposed by society), subject rather than citizen
- through a transitional phase of criticism of this as selfish and a move towards social participation, shared norms and expectations, survival now seen as dependent on the acceptance by others, goodness
- to a phase where there is understanding of the interconnection between other and self – the development of an ethic of care, revolves around a central insight that self and other are interdependent. The activity of care enhances both self and others (honesty and truth to oneself (self-worth) and goodness to others,

accepting responsibility for choice), citizenship; this transition hinges on self-concept

Environmental issues may be presented in such a manner at school that pupils find that their morality is based on educational endorsement of appropriate environmental values. This is a form of subjugation rather than liberation for the student. The response may be to think about oneself and not to consider the environmental 'other'.

Some students may move on to feel that they share their values and, consequently, are participatory not passive in society. The individual may be looking for approval in a sub-group of society; their environmental morals will be developed and moulded under the influence of their social group, and the individual will accept them as their own. The highest level of moral thinking in women in relation to environmental issues can only come about when the women are aware of the relationship they have with the rest of their environment. Without relationship, an ethic of care may not develop and consequently neither may true citizenship.

Gough (1999a) considers that there is a lack of *women's interests* in issue discussion and policy development by virtue of the fact that men have dominated the environmental, and consequently sustainable development, arena for many years. Included as *women's interests* she quotes Brown and Switzer *"...fields of health, welfare, household management... "*. Only recently have some EE packages taken account of this and now are beginning to use examples, such as *shopping* and *washing clothes,* as avenues for exploration of environmental issues[11].

The society that both sexes live in is full of uncertainty. Politicians come and go and individual's lives change due to job and home circumstances. Humans are able to cope with all these uncertainties by developing *'a self of many possibilities'* (p1 Lifton, 1993). The *Protean Self* is shaped by historical and social influences and there have been many of

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these in the last one hundred and fifty years; a view echoed in the research carried out by Belenky *et al* (1997). Lifton sees the aspect of *connection* in women as an inhibitor of *protean exploration*. His interview evidence suggests that although the protean self seeks intimate bonds, *'... women seek them more consistently... through relationships with other people, and men ... through relatively abstract symbolizations'* (p120, Lifton, 1993).

In comparison Belenky *et* al (1997) found that women in their study showed an ability and desire *'... to embrace all the pieces of the self in some ultimate sense of the whole... They want to avoid what they perceive to be a shortcoming in many men – the tendency to compartmentalize thought and feeling, home and work, self and other... In women, there is an impetus to try to deal with life... in all its complexity.'* (p137)

Lifton discusses specific individuals who have changed their view on the environment and environmental issues due to experiences they have had directly. As self can be construed *'... as a multiplicity... '* (p13, Ashmore and Jussim, 1997) with a momentarily dominant self speaking out (Clark, 1991), there is also capacity for a multiplicity in one's approach to the environment.

This process of 'contextualisation' by females is seen in discussion work carried out with 17-year-old students in the UK (Solomon and Harrison, 1991). Females that made opening comments in group discussion of a health issue related to nuclear bomb tests were much more likely to use *contextual* statements than *broad* or *personal* statements. The authors considered the broad statements to have some of the features of Kohlberg's sixth and highest stage, whilst the personal statements were indicative of stage 3 in his moral development levels. Male students were significantly more likely than the females to use a broad, judgmental opening comment in the discussions.

Gilligan (1988) suggests that of the two main organizing structures (justice and care) for thought and feeling when dealing with moral conflicts, if it were not for women there would be virtually no consideration given to the care focus. This is not to say that

men would not raise this focus at all, but it is women's detailed expansion of this that identifies it as a persistent and viable structure. Care and justice are not mutually exclusive approaches. Justice is not necessarily uncaring but, as a focus, it does lead to different reasoning strategies being utilized. Solving a problem using one approach does not preclude access to, or even a final choice using, the other approach.

The principles describing our moral capacity are intricate but do not seem so because of our daily use of judgments. It is these principles that we need to comprehend in order to understand our sense of justice. A just society is one in which all individuals have equal liberties as citizens and those liberties cannot be altered by political or social interests. In a society, the mutually beneficial cooperative develops conflict due to the portioning of the shares; consequently a set of principles is necessary so that a well-ordered society can live with a common conception of justice.

Individuals within the civil society will compare their 'lot' to the agreed principles. It is in disordered societies that disputes can be seen to exist between the individuals in the society with regard to what is just and what is not. The groups that exist in this kind of society have unique conceptions of the principles of justice relating to the rights and duties of the citizens. It is clear that ideas of justice will be more preferable when the consequences of this principle are desirable on a broad basis (Rawls 1972).

Freedom for all can lead to difficulties when placed in the context of a social issue. For example the burning of fossil fuels in one country may lead to acid rain deposition in another and thus affect the lives of people in this second country. Human freedom dictates that the 'polluters' should have the right to burn fossil fuel in their country, but this is having an effect on the welfare of another section of society. Here justice can be viewed as fairness, in such a situation an individual would not compare his own lot to others but consider what it would be like if fortunes were reversed, and thus whether the outcome is fair to others (Solomon, 1988).

Environmental issues are social constructs (Di Chiro, 1987; Robertson, 1994; Grace and Ratcliffe, 2001), this claim does not deny their reality (Burningham and Cooper, 1999), and, consequently, EE is required to explore such issues in relation to social responsibility and social justice (Grace and Sharp, 2000).

3.7 Influences on Action

3.7.1 Factors underlying overt behaviour

In order to study the effect EE can have on action, or behaviour, one must consider the factors that influence behaviour. Fishbein and Ajzen (1975) outlined three such factors that they considered influenced overt behaviour:

- Attitude (the individuals disposition in response to an object, has polarity, it has an evaluative dimension)
- Belief (the cognitive domain, the knowledge held about the object)
- Behaviour Intention (the conative domain, the intent to behave or act with respect to the object)

The authors consider the definition of attitude (evaluative consistency, predisposition, learned) as essential in providing a concept that will lend itself to being measured and manipulated. Attitude is non-observable directly, but can be inferred from behaviour that shows evaluative consistency (Ajzen, 1988). Unlike attitude, they describe belief as non-evaluative. It is simply the information that the individual holds with respect to the object. Cognition, the knowing, of an environmental problem, such as *ozone* (object) being depleted by CFC's (attribute) does not predicate the attitude held by the individual towards that problem. I do not agree with these distinctions. Beliefs incorporate an evaluative dimension by their very nature; they involve emotions and are the basis of actions taken by individuals,

'We humans frequently undertake actions, that is, behaviour guided by conscious thoughts. The modes of thought thus put into operation are called beliefs.'

(p306, Ziman 2000)

Individuals may hold differing beliefs (-strengths) to each other over the same environmental issue. Rather than considering behavioural intention as a special case of

belief, I consider that Fishbein and Ajzen's last two features – belief and behavioural intention – to be part of the same, a belief that is developed through evaluation of knowledge in light of other considerations. Fishbein and Ajzen's linear model - provide knowledge, to feed attitudes, to change behaviour - has been rejected by many researchers and yet, many institutions such as NGO's and the case study school use it in their EE provision.

As if to mitigate the initially simplistic description of the behaviour pathway, Ajzen (1988) superimposed, onto this linear model, his consideration of perceived behavioural control (PBC). PBC '*... is assumed to reflect past experience as well as anticipated impediments and obstacles.*'(ibid p 132). This is especially relevant to environmentally responsible behaviours, whereby individuals' evaluation of a particular behaviour is affected by their perceptions of the controls bearing upon them.

Studies exploring the association between alcohol and (risky) sexual behaviour have highlighted '*... the complexity of the attempt to explain the 'causes' of social behaviour... The effects of* [the object] *were found to depend upon 'the context of the* ... [behavioural]*... encounter... In the majority of cases... people... described their* [behavioural] *activities as the outcome of conscious deliberation'* (p17, Silverman, 2001).

Nordlund and Garvill, 2002, produced a hierarchical model that described relationships between general values (underlying guiding principles) held by the individual, environmental values, environmental problem awareness and personal norm ('*... feeling of moral obligation to protect the environment...* ', ibid p743). The authors referred to norm-activation theory in describing how pro-environmental behaviour would require preceding activation of a personal moral norm, the activation coming about due to the individual perceiving that their values are being threatened. The general values used by these authors were defined as *self-transcendence* versus *self-enhancement*; the environmental values used were *ecocentric* versus *anthropocentric*. In their model, general

values influenced environmental values and personal norm acted as a mediator for the value orientations by directly acting on pro-environmental behaviour. Consequently, the authors highlighted the importance of considering individuals' general disposition to act in environmentally responsible ways, although they too were aware of the complex nature of interaction of causal factors in behaviour such as contextual factors, personal capabilities and habits.

3.7.2 Expressed behaviour versus intentional behaviour

Behavioural changes in any animal will enable it to adapt to a changing and non-predictable environment (Howe 1980, Anderson 1995). However, with humans there is the argument that expressed behaviour may not be the same as intentional behaviour (Reich and Adcock, 1976); pressures from society will affect the behaviour actually exhibited by the individual (expectations of others, appropriateness of behaviour) - those referred to as normative pressures. Normative beliefs (those understood to belong to the wider community) and personal motivation to comply with those perceived norms would form these pressures. If social norms existed that involved more environmentally responsible behaviours, it could be that one would see more of these activities taking place without necessarily being a result of attitude changes (Newhouse, 1990; Thapa, 1999). As expressed in the previous section, behavioural intent, societal expectations and personal values will all contribute to the belief held by the individual. The influence of these factors may result in the intentional behaviour being carried out into practice or it may be 'shelved' based on the belief of its consequences. In trying to determine an individual's beliefs from their behaviour, the observer must have some indication of the desires (the wants) of the individual (Kenny, 2003) otherwise one runs the risk of projecting one's own desires onto the observed individual. These desires can be considered to be towards a

future condition, perhaps one that is not yet properly devised; these desires then, contribute to the values held by the individual (Kitwood, 1977).

Haney *et al* (1996) used Ajzen's theory of planned behaviour to investigate the variables involved with teacher's intentions to follow a U.S. state initiative that would mean large-scale changes in the classroom. This research had a theoretical base not dissimilar to that in EE:

> '*..previous attempts at science reform fell short of successful change because they were not systemic in nature and usually embodied a top-down model of change... it is believed that teacher belief systems are significant factors in motivating a change in teaching behaviour... previous... efforts largely ignored the influential nature of teacher beliefs on changes in teaching practice.*'.
>
> (p 973)

Haney et al (1996) found, from their questionnaires, that teachers' intent to implement a particular strand of the science education model was significantly influenced by different variables. In summarising, the authors stated that the three primary variables:

- Attitude towards the Behaviour
- Subjective Norm
- Perceived behavioural control

all made major contributions to behavioural intent; with attitude towards the behaviour being the most important in aspects of the Ohio model questionnaires. Familiarity with the model, years of teaching experience and grade level taught all showed significant differences in scores for attitude towards the behaviour.

If the length of service and level of teaching has this effect on the implementation of a science education model, these factors need to be considered in the potential application of prescriptive EE programmes (models) into schools. As argued in the Ohio research, Fien *et al* (1993b) consider teachers' beliefs will be precursors to change and the

teacher, then, is the crucial agent in forging a change in pupils' environmental behaviour. John Head (1985) echoes the idea that teachers will be affected by their own beliefs and values and in turn, the pupils will experience these. However, there is evidence that suggests that *'teachers' beliefs may not be accurately reflected in their classroom behaviour...'* (p732, Lederman and Zeidler, 1987), and that appropriate communication is essential.

Rather than trying to infer belief from an individuals' behaviour it is possible to approach from an alternative direction and compare 'predicted' behaviour (based on beliefs and values) with actual behaviour. In trying to predict the (environmental citizenship) behaviour of the students one must take account of individuals' beliefs and desires, with the observer taking an intentional stance (Hales, 1999). In doing this, one is considering humans as intentional systems (Dennett, 1981 and 1987). Notwithstanding criticisms about the validity of an explanation of the intentional stance (Stors, 1996), the adoption of this strategy rests upon the basis that humans act, ultimately, at a rational level and individuals will choose behaviour that will benefit their survival. To predict the behaviour of a person one should *'attribute as beliefs all the truths relevant to the system's interests (desires) that their experience to date has made available'* (p 58, Dennett, 1981). The strategy itself is not fool proof and consequently, as humans are not *perfectly rational* all of the time, it is not always possible to use the intentional strategy to divine behaviour. Nevertheless, Dennett surmises that this factor and that of user interpretation do not take away the validity of the intentional strategy.

3.7.3 The complexity of influences on environmental behaviour

Behaviours under voluntary control are strongly influenced by their consequences (Reich and Adcock, 1976). It follows that behaviours leading to positive outcomes are likely to be repeated whereas behaviours leading to negative outcomes are not.

Traditionally EE has taken a transfer of knowledge format (Loughland *et al*, 2002), where pupils are simply 'taught' about the environment and its problems, with the desired outcome being pupils behaving responsibly towards the environment. This assumes that beliefs, evaluative feelings and motivation towards the environment are changed in a positive way by knowledge acquisition alone.

Thapa (2001) points out that research has not yet found significant links between education and concern for the environment; the education being provided may be increasing pupils' knowledge base and awareness, but failing to engage the affective. As Lofthouse (1994) states, it would be naïve of us to think that behaviour would change suddenly as a consequence of teaching what is deemed appropriate literature. There are many more factors that determine responsible environmental behaviour (Figure 3).

Hungerford and Volk (1990) discussed these and other variables that they considered probably contributed towards an individual's environmental behaviour. The variables fell into three main categories entry-level, ownership and empowerment. The authors highlighted the likelihood of the individual variables acting synergistically and therefore the intra-category variables probably did not follow the linear pattern that the three main categories had with each other.

Posch (1993) found that there was a correlation between strong emotions and readiness to take action. In his research there seemed to be a connection between fear/rage and a readiness for political action and between compassion/sadness and personal action. However, he pointed out that strong emotions might also reduce willingness to become involved. Emotions are notoriously fluid during adolescence and this may well lead to individuals finding themselves unable to commit to action.

It seems that may be the case with some of the pupils in the case study. One particular girl in the first cohort wrote, in her first year (yr8), that she was reluctant to '*think about (dealing with)*' the environmental issues because they made her sad. This, in

conjunction with a belief in the locus of control lying elsewhere, has had a negative effect on the behavioural intention of this student.

Figure 3 - Summary of key factors affecting individuals' behaviour

Environmental knowledge

Intention to act responsibly towards the environment

Locus of control

Economic factors

Social influences

Belief in success of action

Existing *attitudes* towards the environment and its issues

(empathy/sensitivity)

Personal responsibility felt by the individual

Acquisition of skills required to take action

(from Newhouse, 1990)

Research has provided a fairly long list of variables that are most strongly associated with responsible environmental behaviour: verbal commitment, locus of control, attitude, personal responsibility, knowledge, incentives, appeals, information and feedback (Hines *et al,* 1986). Sivek and Hungerford (1990) went on to look at the relative contribution of eight variables to predication of responsible environmental behaviour. A survey was used on individuals from three conservation organisations (so bias existed), which assessed these eight variables and the individuals' level of responsible behaviour. A significant variable in 'predicting' responsible environmental behaviour is skill. Individuals perceive the need for strategies that will allow them to behave in an environmentally responsible manner. It is no surprise then, that adolescents feel that they

will still be unable to contribute much towards protection of the environment as they move in adulthood, as they see that knowledge or possession of civic skills is still lacking at this later stage in their lives (Connell *et al,* 1999).

A second significant variable, determined by Sivek and Hungerford (1990), was, not surprisingly, locus of control. Newhouse (1990) defines locus of control as "*an individual's perception of his or her ability to bring about change through his or her behaviour".* She identifies two main categories of locus of control:

1 - *External*, whereby the individual does not try to bring about change because they believe that change is a result of chance or the intervention of more powerful individuals such as God, Government and Parents.

2 - *Internal*, whereby the individual does believe in their ability to make a difference.

Newhouse highlights the importance of the stance taken by individuals regarding locus of control. She refers to Hines et al (1986), in which it was '*...found that individuals with an internal locus of control were more likely to report having participated in environmentally responsible behaviour than were individuals with more external locus of control'* (ibid, p27).

Locus of control is a major reason why it is not a simple matter of linking environmental awareness to environmental action. Individuals may feel unable to effect a change, perhaps not seeing themselves as part of the solution (Weisenmayer *et al,* 1984). Prelle and Solomon (1996) showed that the young people in their study felt strongly that the locus of control was external. When answering a question on what should be done about a variety of environmental issues the most common response was *'They should... '.* A feeling of helplessness towards an issue resulted in a lack of plausible responses, by the students, as to what they would do about the issue.

Connell *et al* (1999) recorded responses made by 16 and 17 year old pupils, from a variety of schools, indicating a feeling of disempowerment. The students made comments

such as *' I'm annoyed that I'm not in a position of authority where I can do anything about it' and 'I feel really helpless. What can I do? I'm a 16 -year-old kid in a classroom. I've got all these views, but what can I do about it?'.* The concerns for the future demonstrated by the students in this Australian study was also seen in a study by Pawlowski (1996) in Poland carried out in 1994. In his research he looked at University students in both environmental and technical courses. He found that students on the environmental courses were more consistent in their *'pro-environmental responses'*, his recommendation being that environmental aspects of other courses should be improved. The choice of course was an indicator of predisposition towards the environment.

Environmental sensitivity was a third variable that Sivek and Hungerford (1990) found to be significant in predicting responsible environmental behaviour. Environmental sensitivity is *'... an empathetic perspective toward the environment.'* (p11, Hungerford and Volk 1990), which involves *'... the attributes of feelings, beliefs, and emotions.'* (p38, Metzger and McEwen, 1999) and has a number of precursory variables such as association with the outdoors, role models and mass media programs (Sia *et* al, 1985; Sivek and Hungerford, 1990). If EE is to be successful it will require an approach that will enable individuals to develop greater environmental sensitivity. As with any social issue

'... students should be helped to use their well-developed empathic understanding of the circumstances and values of others, along with an appreciation of the legal and democratic processes of our society.' (p 383, Solomon, 1988)

Although individuals' values can underlie behaviour (Eagles and Muffitt, 1990), they are not necessarily easily determined from an individual's behaviour. Values may be held that are believed to be, or actually set at, too high a level for the individual to reach. In this respect the information that the pupils provide for us on paper are merely indicators of behaviour. In reality when faced with the potential to realise their values, we do not really know what the behaviour of the individual will actually be. Economic factors may prevent

an individual from taking up the opportunity to realise his/her desires/wants. For instance, an individual may desire the power to purchase organic foodstuffs, as they believe that non-organic foods contain high pesticide levels and involve chemical use on agricultural land (both evaluated as bad characteristics). They value organic foodstuffs and yet their finances do not allow them to act on and demonstrate this to those around them. By watching the behaviour of the individual we are not necessarily interpreting the desires or the values held by them (Kenny, 2003). The pangs of guilt that may be felt will not necessarily lead to desirable action. Members of society may act in such a way that sustains the dominant social paradigm and yet hold values and beliefs that are consistent with a more ecological worldview. Dunlap and Van Liere (1984) suggest that more often than not this cognitive conflict or *cognitive dissonance* (Fontana, 1995) is reduced by the decrease of support for one of the these paradigms in favour of the other.

Students' evaluative feelings towards the environment may be affected by the behaviour of their teachers or by those they hold in high esteem, as one does not predicate the other (Sivek and Hungerford, 1990), positive reinforcement of behavioural changes they do make and also by the level of enthusiasm and success displayed by those around them.

Lockwood (1999) considers that <u>how</u> humans value nature needs to be taken into account in the assessment of possible options for environmental policy. He highlights the idea that *'Values are presumed to encapsulate the aspirations of individuals and societies: They pertain to what is desirable, to deeply engrained standards that determine future directions and justify past actions. (Braithwaite and Scott)'* (ibid, p381).

If values are deemed central to environmental policy at a national level then surely this is also the case at school environmental policy level. Lockwood describes five categories of value, the orientation of which he considers *"..are likely to be especially strong determinants of their pro-environmental actions because people often need to react*

to environmental conditions or problems on the basis of very limited experience..' (ibid, 382); his emphasis being *"... the values of all people who declare a stake in a decision should, in principle, be taken into account in the making of that decision. Stakeholder participation in environmental decisions is widely accepted."* Evidence exists to the contrary (Connell et al. 1999, Posch 1993, Prelle and Solomon 1996); perhaps pupils are not considered stakeholders.

3.7.4 Factors acting as motivators

More interactive forms of EE allow teachers to expand their roles as facilitators in the classroom. Rather than lecturing or transferring set pieces of knowledge, the teacher can mediate discussion work and allow the pupils to self-generate knowledge and so influence the effectiveness of the EE being provided (Ballantyne *et al*, 2001). Curiosity and interest are motivators to either continue or further a particular behaviour. These are *intrinsic* motivators, that is they are naturally driving the individual, from a very early age, to explore and discover, thus learning. *Extrinsic* motivation is normally provided in schools, in the form of achievement motivation, due to the insufficient level of intrinsic motivation demonstrated by students, towards schoolwork, throughout their school life (Fontana, 1995).

In order for individuals to behave a certain way there must be a motivating force. Simmons and Widmar (1990) list a variety of possible factors acting as motivators towards positive environmental behaviour (Figure 4).

As pupils move into secondary education they will review their priorities and develop different motivators. Connell *et al* (1999) found that the 16 and 17-year-old pupils they interviewed were motivated by personal and academic criteria. In their study, only a few students showed any concern for society or the future, which was not directed towards the environment arena.

Figure 4 - Possible motivators towards positive environmental behaviour

Underlying values – sense of right and wrong

Desired lifestyle

A sense of responsibility to future generations or to the environment

Sensitivity towards environment

Economic factors

(from Simmons and Widmar, 1990)

3.8 Changing Pupils' Beliefs-Values Structures – Social Development

The position of an individual's personal value will shift within a framework of personal proximity to environment with time. Changes instigated at the international level may well have an effect at the local level and therefore directly concern the individual. For the majority of people, worries will be concentrated in the area of the framework that corresponds to close proximity both temporally and spatially (Connell *et al,* 1999). '*Life for these people is difficult, and they must devote nearly all of their efforts to providing for themselves and their families, day by day. Other people think about and act on problems farther out on the space or time axes...* ' (Meadows *et al,* 1972). A number of factors such as culture, past experience and the perceived immediacy of the problem will affect the location of an individual's value within this framework. Meadows *et al* point out that the greater the value of the time or space variables, the smaller the number of people who are actually focussed on a solution to the problem. Environmental education should foster a link between the two extremes. Individuals may well develop a belief that the locus of control is externalised. Perhaps educators should endeavour to contribute to the values held at family and local level in order to influence the development of positive attitudes and internal loci of control within their pupils.

In order to develop positive behavioural changes, individuals need to explore the values and attitudes they hold towards socio-scientific issues. These are more overtly 'life' relevant (Wals *et al,* 1997) than the science curriculum material followed at both Key Stage 3 and 4. Ratcliffe (1998) argues that teachers need to provide pupils with group discussion frameworks so that focussed discussion is '*... systematic and evaluative...* ' (p58) in order that the evidence comes out more strongly than individuals' personalities and strengths of character. Although Ratcliffe highlights a number of positive features of frame-working discussions, I consider the impersonal nature condoned, along with the

identified lack of pupil ownership, to be major weaknesses. Conflict resolution, discussion-based education may well be the way forward for EE when directed at female students due to the nature of their interest in people (Solomon, 1997). Individuals need to be encouraged to take part in informed debate, where they will have opportunities to scrutinise the values and attitudes of fellow class-mates and present reasoned arguments of their own, however, Ratcliffe's framework seems somewhat prescriptive - reminiscent of Science 1 Investigation frameworks. Discussing these issues will allow the individual to become more aware of the level of their own understanding and the subsequent internalisation and incorporation of the information discussed in the group may lead to changes in values. According to Ratcliffe, the framework should allow this to occur due to the influence of peers in the group and with minimal teacher influence. The disadvantages presented by a discussion format of this type include the possibility of consensus when confronted with a difficult issue, new knowledge may not be acquired and in some cases, if there is no review, pupils may leave in a confused state.

Fisher (1998) notes that common sense may need to be rejected or refined in order to assimilate the new information. He refers to two modes of thinking that have been described by other researchers previously, *'life-world'* and *'scientific thinking'*. His investigations found that as students progressed from year 8 to year 11, they too moved from using a high proportion of 'life-world' explanations to those classified as 'scientific'. This move to a more conceptual thinking may be a contributory factor to the other changes seen in pupils such as the move to a more global perspective and a feeling of dissociation from environment events.

Gigliotti (1990) states that simply providing more knowledge for pupils to learn will not change attitudes towards the environment. He calls for a change in the *belief-value structure*, whereby society moves from its perception of humans as separate from the environment and each individual recognises their involvement and responsibility to make

positive changes. The crucial factor being *societal change*. It may be that, similar to the GIST (Girls into Science and Technology) project analysis, the atmosphere cultivated at home is much more influential than the atmosphere at school (Solomon 1997). In the same way that home may be open or closed to varying degrees to external influences and thus influence science choice, home culture may be extremely important in the development of more favourable environmental behaviour. Intergenerational communication can be used to bridge the divide between these two cultures (Ballantyne *et al* 1998 and 2001) and encourage the societal change that is necessary to achieve the objectives of EE in schools.

As highlighted in Wals et al (1990) schools need to provide an atmosphere in which pupils can not only reflect on their personal exploration of environmental issues, but one in which they are able to then act in the community; an atmosphere in which all teachers are responsible for the provision of EE in a cross curricular approach. This more holistic approach to EE has been endorsed by a number of others in this field (Palmer and Neal, 1994; WCED, 1987; UNESCO, 1977). The philosophy of this approach, which supports the autonomy of the pupils in their learning experience, is not unlike that suggested for raising standards throughout school education (Black and Wiliam, 1998). Educators need to arrive at a consensus on the degree of integration of EE. Some wish to see the teaching of EE as an inseparable aspect of all the curricular subjects, (Chen, 1997), whilst others may still wish to see it as a recognisable component of core courses (Wals *et al,* 1997).

In whatever way EE is provided, in all likelihood it will have the same main objective. Today's individuals need to have empathy for the environment they are part of (Thapa, 2001), and a desire to take care of the environment in the present, in order that the environment *and* the economics of the future are taken into consideration.

Environmental education may be shifting from established versions (whereby students learn about environmental issues and the teacher tries to invoke desirable behavioural modifications), towards *The New Generation of Environmental Education* in

which individuals develop *action competence* (Breiting, 1994). In this paradigm of EE the understanding is that there is no absolute right or wrong approach to an issue and it is difficult to say what the issues of the next 30 or so years might be.

Instead of pre-determined behavioural changes being encouraged by educators, the future of successful EE may be in the development of strategies that help individuals to make up their own minds (Robottom, 1990), to feel ownership of their behaviour, and therefore be more inclined to act on intention. If provided in an open atmosphere of true dialogue, individuals should be capable of coming to appropriate decisions *for* the environment, of which they are part. The very nature of EE, its implicit requirement for discourse, determines its subjectivity. Environmental educators have to be aware of assumptions they make regarding the 'science' aspect of environmental knowledge and not to predetermine the effect on a student, as intent to act will not come about by passive absorption but by the student actively taking part in the discourse and reconstructing their knowledge and understanding (Gough, 1999b).

This call for a paradigm shift is echoed elsewhere (Gough, 1987; Robottom and Hart, 1993; Sterling 2001). Regardless of the name used – *ecological paradigm*, *alternative educational paradigm*, the characteristics have come from the same eco-philosophical approach.

'Physicians, anthropologists and environmentalists are starting to adapt their procedures to the values of the people they are supposed to advise... Such a science is one of the most wonderful inventions of the human mind.'

(p4, Feyerabend, 1993)

4 Research Methodology and Initial Outcomes

4.1 The Research Approach

4.1.1 Case-study Methodology

The methodological approach taken to this research was that of a case study. This was taken as a '*strategic decision*' not a determination of method (Denscombe, 1998). The researcher observes the situation and determines to develop a deep understanding of the many and varied occurrences through a single instance experience (Cohen and Manion, 1994). Unlike the mathematical sciences:

> '*...the subject matter of the world in which the educational researcher is interested is composed of people and is essentially meaningful.*'
>
> (ibid, p110)

The case study aim is to provide the researcher and readers with increased understanding, rather than increased knowledge. The information gathered is not judged against predetermined goals and is therefore not performance assessed. The written research project should enable the recreation and visualisation of the case study scenario; descriptively rich, providing the reader with details of the social interactions taking place in the institution under study (Thomas, 1990). This kind of study is exploratory and inductive (Marcinkowski, 1993) in nature; it is trying to tease out meaning of the situation from the individuals involved in the study (Mrazek, 1993). The case study involved both participant observation and survey-type research taken over an extended period of time. Features of the case study methodological approach that made it attractive in this research are summarised in Figure 5.

The evidence gathered during the course of the research is contextual, and is about humans as a 'whole' within this unique context. Although my sympathies lie with the interpretive tradition of this type of research, quantitative approaches have been used to gauge the

applicability of some of the observations made, at the individual level, of a wider school community. I am aware of issues of legitimacy that shadow case study methodology in some academic circles. It is hoped that many of the criticisms levelled at the rigour of case studies (Kyburz-Graber, 2004) are dealt with in section 4.1.4. By reducing the gap between researcher and practitioner, I am conducting engaged education research (Edwards, 2002) that is relevant and responding to the context of the learning environment.

There are a number of advantages to be gained from carrying out a longitudinal study using both participant observation and survey-type research methods, a number of these stem from the richness and depth of data collection in a unique situation of which the researcher finds themselves a part (Table 5). The approach involved intensive and extensive temporal study of pupils at the chosen school.

The intensive part of the research focused on, in the first instance, a small group of pupils who were able to give detailed information during interview sessions; and in the second instance, a class set of pupils who were tracked from entry into the school to their final main school year, a total of four years, through written exercises. This longitudinal aspect to the study is an approach advocated by a number of other researchers in the field of science education research (Helldén, 2001). This case study included both cohort (longitudinal) and cross-sectional aspects. Peterson and Tytler (2001) emphasised the depth of insight that can be provided by a longitudinal approach and tracking of particular pupils to explore some of the complexity of thinking; which necessarily involves some understanding of the pupil's view of self. The case study school is an institution of modernity that will contribute to the shaping of the pupil's self-identity. As pupils develop, year upon year, they are exposed to aspects of

Figure 5 - Summary of attractive features of case study methodology

- Based on experience and thus realistically strong – no imposition of unrealistic controls
- Allows the subtle intricacies of the situation to be explored by concentrating on one complex social instance
- Offers some understanding of the various meanings of the situation as taken by the participants in the study
- Simply having rich, detail data of this kind may prove of use to other researchers with other interests
- Provides information upon which action can be taken by the individuals or institution involved
- The reader is able to judge the information on the situation for themselves – the reporting is more user friendly (in this case, the user being other educators) than many other educational research reports
- This approach encourages the use of a variety of research methods. In conjunction with a variety of sources of data this facilitates triangulation.

(from Cohen *et* al, 2000; Denscombe, 1998)

Table 5 - Advantages and disadvantages of survey-type and observation approaches to the case study

	Advantages	Disadvantages
Survey-type	• Objective i.e. interaction is with respondent and survey, minimal researcher contribution • Quantifiable measure contributes to validity i.e. the questionnaire was used to explore informant responses • Allows a degree of generalizability within the school, within and across year groups	• Unsuitable for deduction of causes and reasons for behaviour • Individual responses is lost in the anonymity of the aggregated response
Participant observation	• Superior collection of non-verbal evidence. E.g. pupil groaning in responses to the mention of Environment PSHE • Notes can be made of conspicuous features of behaviours e.g. the social influences on informants' participation in the school biology club • Researcher is able to develop close and informal relationships with individuals in the study e.g. trust in confidence of personal interview responses to the researcher were developed over time	• Open to criticism of subjectivity in data collection and interpretation i.e. researcher is implicitly part of the research and will be feeding into the research data (however, as a teacher – researcher this criticism is, in part, mitigated) • Qualitative measure is deemed more imprecise than quantitative measures

(from Cohen *et* al, 2000; Denscombe, 1998)

environment that progress through from the local to the more global. Intrinsic to a better understanding of the environmental thinking that takes place in the pupil, it is intended to

endeavour to explore the contribution of that, and other disembedding mechanisms (Giddens, 1991).

In terms of extensive study, information was recorded from a number of other individuals and classes spanning the breadth of the *'main school'* (a term used by case study staff to denote year groups 8 to 11, that is to the end of compulsory school age). It was hoped that by sampling with a mixture of the two types of method one might determine, to some degree, if changes in attitudes towards environment and EE were largely dependent upon school experience or extra-curricular experience (Becker et al, 1961).

In addition to this, it was my intention to collect data from a neighbouring girls' grammar school and from co-educational schools further afield. Although some data was recorded, it was a less than successful task, with some of the problems illustrated in section 5.1.3. This did not detract from the case study as it is neither appropriate for, nor the intention of, this research to reveal a set of absolute, generalizable, processes and responses in EE in all secondary schools.

Rather, this study aims to show the effects of a particular approach to EE in a particular girls' school in the south of England during an identified period of time. In doing so, parallels may be seen with studies in other institutions (Mrazek, 1993) and inferences may be drawn and used to aid the development and implementation of EE practice in a variety of schools elsewhere:

> *'... The aim is to **illuminate** the general by looking at the particular....'*
>
> (p30, Denscombe, 1998)

4.1.2 Action Research

Throughout the case study there were elements of action research in the approach I took. In many instances action research is an approach taken by those who have identified a practical problem or issue in the place of work/organization and determine to explore possible cases and solutions, which are put into practice, before their evaluation. Often there is an aim to the adoption of the action research approach - that is, improvement and reformation being brought to the workplace (Cohen et al, 2000; Newman, 2000); in the case of education, enabling teachers to better understand and improve their practice (Rönnerman, 2003). Although slightly wary of the goals of different approaches to action research, Leitch and Day (2000) still see it as having *'...a key role in encouraging reflective practice...'* (p182).

As introduced in Chapter One, the problems identified developed from observations I made during lessons and as a consequence of experiences with BioSoc:

- The negative attitude pupils seem to develop, whilst at school, towards environmental issues
- The feeling of disempowerment that the pupils develop during their progression through school
- The perceived lack of action (in relation to environmental behaviours) taken by pupils both whilst in and out of school

As a teacher at the school I had a vested interest (a pertinent exploration of teachers' emotions is provided by Nias, 1996) in exploring the situation such that I could improve my understanding of these changes and reflect on my practice as a potential contributing factor. In the preliminary stages my approach had similarities to action research in that, as teacher, I was

researcher and I had identified a problem with BioSoc; with which I was personally involved. Although the commitment may have been variable by those involved, in some sense a collaborative reflection (Waters-Adams and Nias, 2003) took place, with club member interviews, on the status of the club and how the pupils felt about their participation. Changes to club practice were instigated, and with its continued demise, I asked the pupils to reflect yet again. The 'reflection' interviews exposed deeper issues than those identified above. The specific characteristics of this early approach go some way to dealing with criticisms that have been levelled at 'mainstream' action research (Chisholm, 1990). Although an improved understanding of the situation could contribute to my feeling of empowerment to negotiate wider 'change', as an aim this was to be restricted due to my position within the educational institution and the curriculum structure in place (Denscombe, 1998).

Action and research are integrated (Somekh, 1995), so that the study influences school practice on a variety of levels, from one to one interaction to departmental education provision. Fundamentally, the objective of this research was to add to EE theory and inform me of the phenomena being dealt with in the case study school. Although a scientific approach was followed, it was done so more loosely than in other, more applied, studies, as there was emphasis on understanding this specific problem (in this particular school) rather than developing generalizable theory. There is a risk, that in trying to collect evidence from a number of different populations and compare data between them, the distinct characteristics of those separate populations makes a nonsense of comparisons and following generalizations (Dillon *et al*, 1999).

The action research approach took the form of researcher diary, interviews, questionnaires and freewriting tasks that occurred throughout the 6 years of the study. The

flexibility in this kind of approach was much more suitable for integration into existing school life than a more rigid, strictly scientific method.

There was a question of validity and reliability that was to be answered during the course of the case study (Thomas, 1990). Validity was increased by:

- seeking information from a number of different sources and discussing interim findings with colleagues at the school (this was done especially during the early stages whilst focusing on BioSoc)
- explanations being revised as more information is acquired (this occurred throughout the project, the increasing body of evidence being read in conjunction with existing literature)
- external validity, generalization was not possible but inferences might be made to other cases (in the main study it was intended to gather data from other schools)

and reliability increased by:

- discussion of judgements with colleagues and tutors (coding tasks checked for reliability and verbal discussion with colleagues and tutor)
- design of questionnaires and tests that require re-visitation of themes to check responses (Chapter 5)

4.1.3 Ethical considerations

In essence I wished to improve my knowledge of the changing situation at the case study school with regard to those observations stated earlier. I am not able to report everything that happened during the period of the study, as this would infringe individual privacy (Becker *et al,* 1961) and possibly lead to harm. There is a fine balance between my obligations to the study and to those of my colleagues and pupils at school; an ethic of care pervades the project (BERA, 2000). All pupils and staff are identified by pseudonyms, protecting their anonymity.

It was hoped that by being a teacher at the case study school and being an integral part of its community, problems associated with 'expert' or 'researcher' status were reduced (Rickinson and Robinson, 1999); and could even be seen as being conducted within the philosophy of feminist EE (Di Chiro, 1987):

> - Appreciation of personal experience of the practitioner allowing self-reflection on educational practices
> - Raising awareness within the educational community, encouraging partnerships in critical analysis of practice
> - Re-evaluation of long-held beliefs about the theory, principles and practice of teaching and learning
> - Embracing change in teaching practices that free it from social restraint and convention
>
> (from p 44, Di Chiro, 1987)

4.1.4 Methodological paradigm 'fit'

Research in education is often characterized as one of two main paradigms, in a 'Kuhnian' (Kuhn, 1996) sense:

- *Interpretive* (idiographic, concerned with the individual case - *qualitative)* or
- *Positivistic* (nomothetic, concerned with uncovering general laws - *quantitative)*

with a third, much less common:

- *Critical theory* (socially critical, emancipatory)

This can lead to clashes amongst researchers and competition exists between these alternative paradigms (Hart, 1993); although some researchers argue that the use of paradigms in the social sciences is not strictly in keeping with the 'Kuhnian' sense (Disinger, 1993; Jickling, 1993). To study the learning and changes associated with EE one needs to consider the individual learners but this may not lead to statistical generalizability of the findings, and any *validity* is set in the context of the case study. However, analytical generalizability statements may be valid. Survey data may give evidence of a widespread pattern of deficiency but no insight into why changes in environmental behaviours are or are not taking place. It seems clear that both types of problem solving are needed to develop our understanding of the learning and progression of EE.

Indeed, this is the approach taken in this case study. The research falls into two main phases, the first phase being purely qualitative in nature, the second continuing the use of qualitative inquiry but extending that to use a quantitative method, which is still seen, by some, to have the 'edge' for purposes of validity[12].

Grounded Theory (Strauss and Corbin, 1998; Taber 2000) builds on these two approaches, beginning with detailed individual case study information. The researcher commences with an open mind; with observations clouded as little as possible by existing theories (theoretical sensitivity). He/she develops an *emergent fit*, modifying categories to fit the data, not selecting the data to fit the categories.

This approach uses a variety of data collection strategies to provide multiple points for *methodological triangulation*. Initial data analysis will provide codes that are subject to change when used with a large data set – there is a constant process of reviewing the emerging

[12] pers.comm. D.Sivek 13/02/03

model against the data collected (*constant comparison*). Grounded Theory requires cycles of research activity:

'The researchers theoretical sensitivity during the analysis of data leads to hunches that suggest the next step to take...'

(p.471, Taber, 2000)

The data collection and the resultant emerging theory guides the researcher in the necessity to continue collection (theoretical sampling) until one reaches a point of theoretical saturation; that is to say, further data collected does not significantly change the model.

Research that is to develop grounded theory avoids the defining of narrow research questions at an early stage. The researcher enters in to the field of research with an interest in a phenomenon that seems to be worthy of further attention; aiming to develop testable theory, implying statistical generalizability, which will require survey techniques. Only certain aspects of the evidence collected will be open to this type of generalizability testing, as some evidence will be too complex (involving changes in the *line* of argument that cannot be determined from survey material). In this case replication studies, using pupils in other groups or institutions, may provide generalizability (Mrazek, 1993; Cohen and Manion, 1994). The methods used in this research can be quite easily employed in other schools where similar conditions apply (Table 6).

This eclectic mix of methods used in this case study is surely in keeping with the *'...openness and flexibility...'* that Taber (2000) refers to as appropriate for grounded theory development (Figure 6), and, consequently,

'Through this process it is possible to move from case studies to general models which offer testable predictions... to bridge the divide between authentic accounts of the individual case (rich in detail, but only able to offer 'insight into' or 'resonances with' other cases), and

generalized accounts which offer meaningful advice for curriculum planners and classroom teachers.

(ibid, p.483)

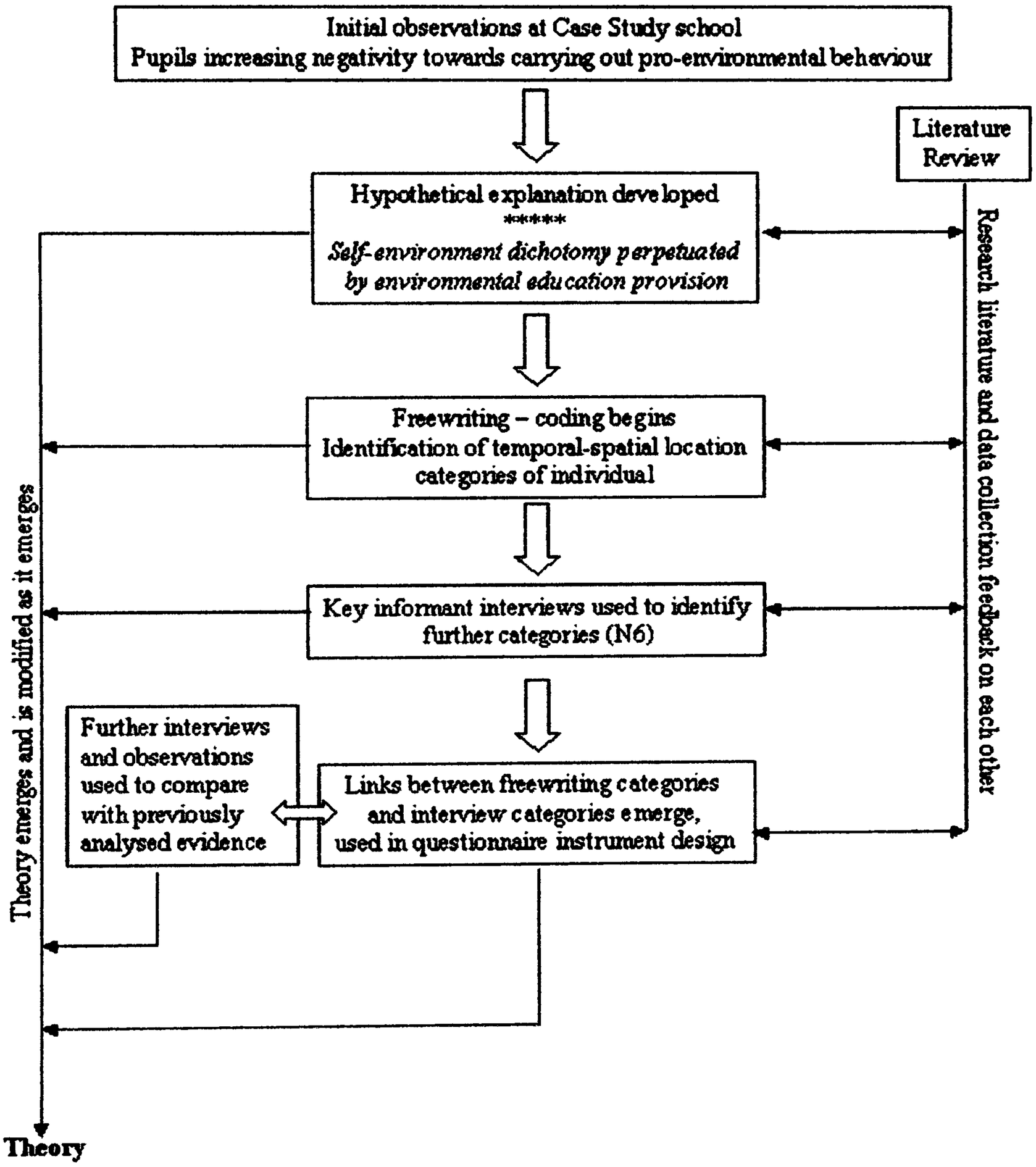
Table 6 - Methods of data collection used in this case study

1. Free-writing tasks	Chapter 4.4
2. Secondary Key Informant interviews	Chapter 4.5 Chapter 5.2
3. Primary Key Informant interview	Chapter 5.2
4. Pupil questionnaires	Chapter 5.3
5. 'Peripheral' pupil interviews	Chapter 5.4
6. Teacher questionnaires	Chapter 5.5
7. Researcher-teacher interviews	Chapter 5.5
8. Questionnaires from other school's pupils	Chapter 5.6
9. Peripheral evidence within assessment material	Researcher access
10. Informal observations during lessons	Researcher diary
11. Direct researcher-observation	

The use of qualitative methods (on the whole), the case study approach and the action research aspects of this investigation identify my overall position as interpretive in nature (Cantrell, 1993). This position came about as a combination of my beliefs and constraints of time, resources and institution of study. The research project is of a particular case, the data collected is contingent on the situation and the characteristics of that situation; Driver *et* al (1996) identify that replication in some scientific studies is not possible and that '... *the key methodological challenge ... is to legitimate... interpretations ...* ' (p26). As such it is not

aiming to provide a theory that would allow prediction (Marcinkowski, 1993) of, for example, behaviour of pupils in a similar situation. It will, however, contribute to the description and explanation aspect of theory.

Figure 6 - The grounded theory style approach followed by the case study research



4.2 Preliminary

During the academic year 1996 - 1997, from more casual observation and conversations, I began to build a 'sketch' of a disparity existing between the attitudes expressed and the environmental behaviour of Year 8 through to Year 11 pupils, with respect to EE and to environmental issues themselves. The 'sketch' was suggesting differences in values placed on what were perceived as environmental aspects of life as opposed to the more pertinent aspects of the pupils' lives.

A combination of qualitative methods was used within the preliminary data collection period. In using these methods it was intended to show

'...a 'deeper' picture than the variable-based correlations of quantitative studies.'

(p18, Silverman, 2001)

One of these methods, observation, formed a basis for data collection at this time, contributing to choices about population sample and further data collection methods to use. From the beginning of the autumn term, academic year 1997-1998, I kept a diary to record any events that could be considered pertinent to the disparity referred to above.

During this preliminary stage of the research and, in part, due to constraints generated by provision of the school curriculum and pressures on pastoral aspects of school life it was decided to use convenience sampling; choosing a class of pupils that I taught and had as a form group. Not only would it require minimal adjustment in personal organization of tasks and avoid interference with colleagues work load and schedule, but it allowed me to work with pupils, to whom I had 'free' access and who were better known to me, contributing to easier communication.

4.3 Free Writing

4.3.1 'Conditions' of the free-writing task

In free response the pupils were not given answer options, rather, they were asked to fill in with their own response; the length of which would be determined, to some degree, by the size of their handwriting and whether they chose to turn over and use the back of the page, or even ask for more paper (The questions can be seen in Figure 9). Reasons for choosing to use free writing as a technique at this stage are summarized in Figure 7.

The students were given a sheet of A4 paper and the two questions were projected onto a screen for the whole class to see, pupils then responded on their sheet (Figure 8). This was possible for cohort A in Yr 8 and 9 as I taught this class Biology in their form group. From Yr 10, onwards, form groups were dispersed during lesson time, as they had chosen options, consequently, the group would not sit as a single form except in tutor time and PHSE lessons. In Yr 10 it was possible to use the transparency again as I sat with the group during a 'fortuitous' tutor time cover period. In Yr 11 it became increasingly difficult to 'catch' the whole form together and so A4 sheets were produced with the two questions pre-printed in exactly the same way as on the over-head transparency so that the, then, form tutor could carry out the task when it was appropriate during a tutor period. There was the potential for 'enforced' restriction on writing space, however, the spaces between the questions were kept exactly the same as on the overhead used in previous years and, as before, students could turn over and use the reverse side if they so wished.

Figure 7 - Summary of reasons for using the freewriting approach

To:

- minimize the influence of the researcher in the students' statements

- keep the task simple for the students

- enable a relatively quick task to take place within lesson or tutor time

- allow students the flexibility in their answer – so as not to feel constrained by further teacher input

- enable students to use their own language – thus informing the researcher for future inquiries

- encourage fairly spontaneous responses that have not been contrived – thus indicating items of familiarity and importance to the students at that time

For each student in a class, the data that was collected was two-fold. Firstly, students wrote, in their own words, what the term 'the environment' meant to them. Their statements described the pupils' conceptualizations of a phenomenon (Robertson, 1994). Secondly, pupils identified environmental issues that, at that instance, were of concern to them. This second statement was asked in order to provide an indication of the affective dimension involvement in their responses. This task was carried out in a school classroom, the social context of the task. The classroom differed from year to year and, consequently, so would visual stimulus in the room. In addition to this, the change in tutor would also have contributed to a different social context. Nevertheless, the responses should provide an indication of the:

'*... characterizations of descriptive categories of* [student's] *explanations.*'

(p27, Robertson, 1994)

Figure 8 - Pupil 9 freewriting responses in Year 8 (1997/1998)

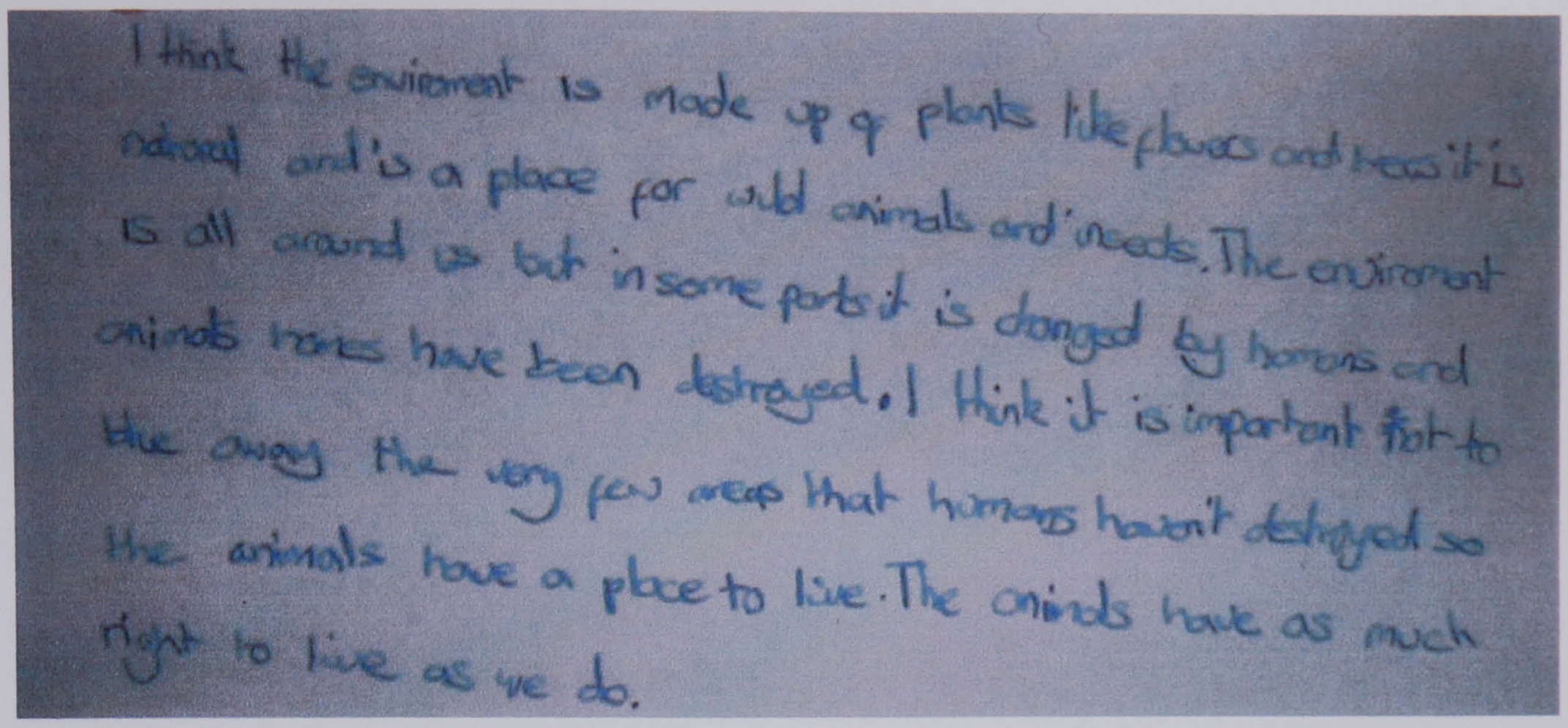
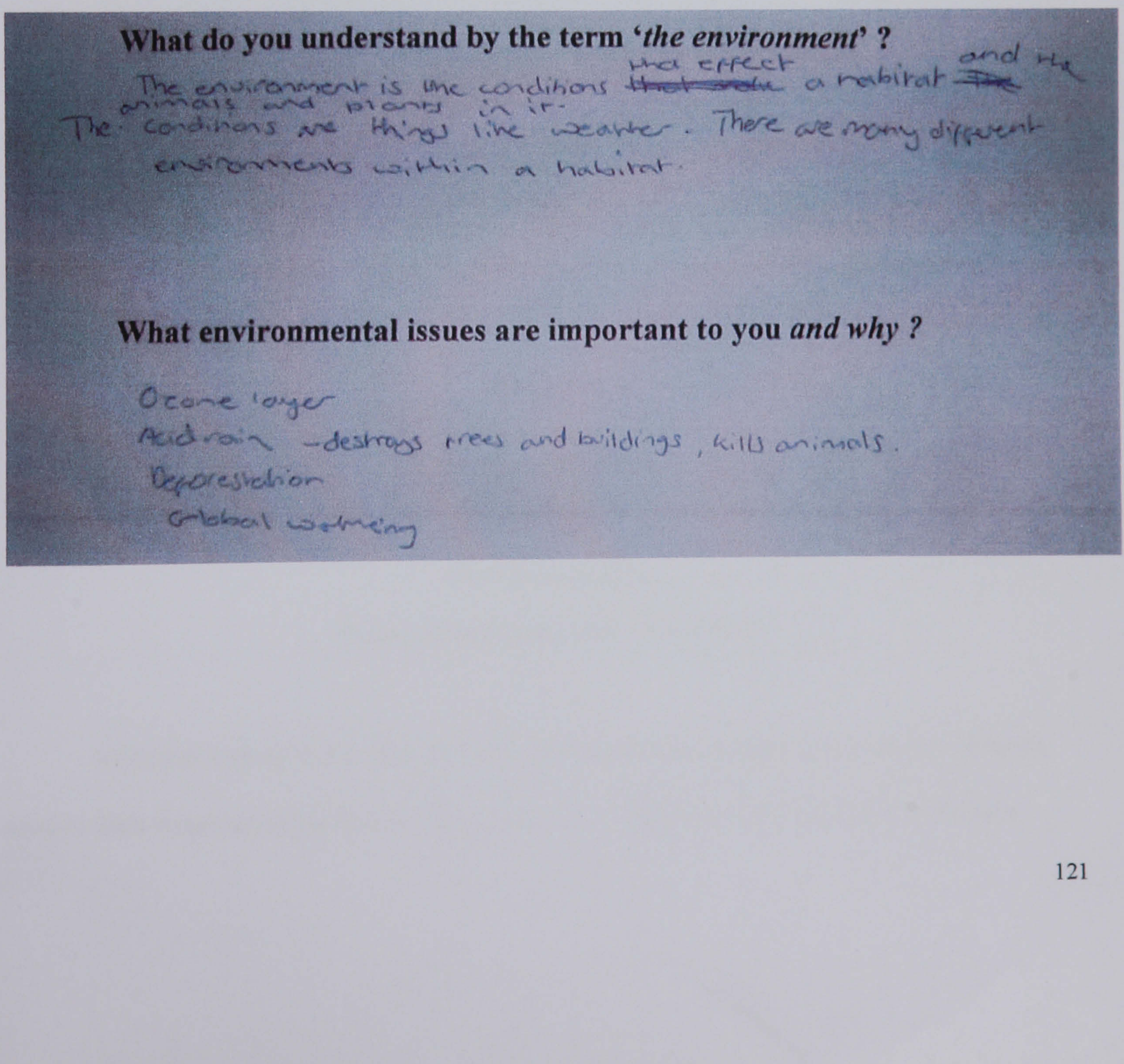

I think the enviroment is made up of plants like flowers and trees it is natural and is a place for wild animals and insects. The environment is all around us but in some parts it is donged by humans and animals homes have been destroyed. I think it is important that to the ones they very few areas that humans haven't destroyed so the animals have a place to live. The animals have as much right to live as we do.

Figure 9 - Pupil 9 freewriting responses in Year 11 (2000/2001)


What do you understand by the term '*the environment*' ?

The environment is the conditions ~~that make~~ the effect a habitat ~~The~~ and the animals and plants in it.
The conditions are things like weather. There are many different environments within a habitat.

What environmental issues are important to you *and why* ?

Ozone layer
Acid rain - destroys trees and buildings, kills animals.
Deforestation
Global warming

4.3.2 Coding Process for Free-writing

The first step in analyzing the information these free writing pieces held was to devise a code that allowed the complexity of the data to be reduced somewhat, in order that one could begin to 'see' how the students conceptualized the written term 'environment'. The approach used was not dissimilar to that of an Australian project with primary and secondary aged pupils by Loughland *et al* (2002), where it was described as phenomenographic (pupil experience is reflected in their written conceptions). Clearly, by enforcing a set of categories to classify the data, some of the richness of the writing will be lost. However, one can reduce this impact by carefully choosing those categories to be retained and those to be relinquished, ensuring that enough are retained to separate out responses widely enough without keeping a multitude of categories that have very little difference from each other. The freewriting was given to three cohorts over a number of years (Table 7). Once all of the responses to Yr 8 and Yr 9 for cohort A were received the answers were searched for appropriate coding categories to be used. This coding was reviewed over the next two years as further data was collected.

The responses to the two questions were coded in two ways. Every statement 1 from cohort A year 8 was read to produce a *working* list of items presented by the pupils:

Abode

Surroundings

Biological components
Physical components
} Non man-made items

Man-made items

Environmental issues

Human influence/dependence or stewardship

An initial coding frame was set up to distinguish between the combinations of items used in their response to the first question. The last category in the first frame included a

reference to humans in some way (not just mention of a man-made item); any student response that fell into that category immediately required re-coding using a second coding frame that teased out the *aspect* of human inclusion.

Responses to the second question were analysed for each environmental issue presented. These were then located on a rank scale of issues to allow change in issue reference to be tracked for Cohort A from Yr 8 to Yr 11 (section 4.4.2.1). In addition to this the second statement, for each pupil, was coded using another two frames. One was designed to distinguish the emphasis of environmental issues based on geographic scale:

- **Proximity of pupil with issues**

The second frame was used to distinguish timescale intimated by the pupils' writing:

- **Temporal location of issues**

The full analysis using these two frames can be seen in section 4.4.2.3

Table 7 – Cohorts involved in freewriting

	Academic Year – ending :			
Cohorts who produced freewriting pieces	**1998**	**1999**	**2000**	**2001**
A	✓	✓	✓	✓
B		✓	✓	*
C			✓	✓

*Unable to be completed due to pastoral issues

4.3.3 Reliability of free-writing coding

All the statements made by the pupils in Cohort A (Yrs 8 through to 11), Cohort B (Yrs 8 and 9) and Cohort C (Yrs 8 and 9) were coded using the four coding frames. In

comparison to the Australian study (Loughland *et* al, 2002) this research identified a larger set of categories for pupil combinations of responses. It was hoped that retaining this larger set of categories would reduce the impact that categorization has on the diversity of responses given by the pupils. The sets of statements were given to two other individuals to be checked for inter-researcher reliability in use of the frames. These two researchers coded a sub-sample of the freewriting data using the frames following a brief (15 - 20 minutes) discussion with me. It took approximately one hour to complete a single cohort, single year, using one coding frame. Checker 2 spent in the region of 12 hours coding data whilst Checker 1 spent in the region of 6 hours coding data. The agreement, between the checkers and myself, in coding was greater than 50 % in all cases (Appendix I), this was not acceptable and the coding frames were re-considered.

Both checkers met with me, separately, to discuss justifications for coding given to the data. In the first coding frame, it was decided to join 'Biological' and 'Physical' conditions together as a single 'and/or' variable in a code option, as it was found to be difficult to determine which of the two the pupil may have been thinking of when writing their answer with terms such as '...natural things...' and '...flowers and air...'. With these changes, the first frame was reduced to 10 categories. Specific examples for each category were retained in the coding frame for reference. The changes with respect to 'Biological' and 'Physical' references were carried through to the second frame and one category was removed completely to reduce the frame to 10 categories. The Temporal coding frame was simplified by removing some examples of freewriting text and indicating on the frame the 'term' over which time was being referred to; this required the coder to read the whole passage to generate an impression of the pupil's approach. The Proximity frame was discussed, and resulted in the decision to move 'pollution' from global to a lower level. This coding task was found to be

difficult when a student indicated levels that spanned the range from local to global, in this case the coder was asked to read the whole passage again, and generate an impression of the *emphasis* given by the student. The checkers were given the same responses to code again with the revised coding frames (Appendix I).

Discrepancies were identified and discussed further. The coding reliability (greater than 70% in all cases) was accepted, based on the interpretive nature of the analysis.

4.4 Free-writing Analysis

4.4.1 Question 1 - What do you understand by the term 'the environment'?

For Cohort A, the data was taken over the four years of their main school education, for cohorts B and C it was taken over their Yr 8 and Yr 9. There were some alterations to the EE provision from the school to these cohorts.

The majority of **superficial statements** (those simply referring to surrounds without indicating detail in their written construct) are found in the Year 9 pupils. During Year 8, for each cohort, there were no superficial statements, every pupil touched on a qualifying characteristic when describing environment. However, in Year 9, a discrepancy appeared between cohort A and the other two cohorts. Almost one fifth of cohort B and one sixth of cohort C responded with superficial statements about their surrounds without mentioning abode or any other characteristic. The increase in these superficial statements during Year 9 may be due to use of the term *surrounds* or *surroundings* in the environmental science component of their Key Stage 3 Science programme (taught a few weeks before this task was carried out), before going on to qualify with characteristic components. It may be that pupils are concentrating on the first element of the teaching provision in their response, ignoring their 'younger' more fluent descriptions.

During their **Year 8**, cohorts B and C had high proportions of students responding with answers showing merging of the meanings of the terms 'habitat' and 'environment'. For all three cohorts in Year 8, between one third and one half of the pupils referred to some biological and/or physical component to the environment. Key environmental terms and 'definitions' are taught within the biology component (Science 2) of the Key Stage 3 programme. Between 38% and 48% of the pupils in each of the three cohorts included humans

in their written conceptualisation of environment, the differences were not statistically significant different (using chi square comparison, $p>0.4$).

In **Year 9** a decline in the references to human connection in pupil responses was accompanied by an increase in descriptions that conformed to NC teaching of 'Environment', in the case study school. Cohort A retained a higher proportion of responses that included a link to humans, 41% compared to 8% and 21% in cohorts B and C, respectively. Cohort C showed an increase in the references to environmental issues, whilst cohort B did not comment on named environmental issues at all. In cohort B, a third of the class responded with purely biological and physical items in their definition, this was more than twice as many as that in either cohorts A or C. Overall, cohort B contained a greater proportion of statements constructed of 'non-human linked ecological terms', that is statements restricted to biological/physical/abode type descriptions.

A response including environmental issues in isolation from human reference appeared only once, in all of the data collected (Cohort A Year 10). The referencing to environmental issues was greater for pupils who had written concepts that included humans (i.e. from coding frame 2).

Cohort A continued to complete freewriting tasks for a further two years. In **Year 10** there was a decline in the proportion of pupils (29%) who included humans in their descriptions. Four of those who had done so in Year 9, changed to write Yr 10 statements that held more biological/physical component descriptions; a shift in line with a 'definition' style of teaching (statements lacked originality, they followed a common pattern in line with curriculum teaching).

'The environment is everything around us. The trees, the ozone layer. The environment is the factors that make up habitats. There are different habitats that have different environmental factors such as climate, animals and plants.' (Pupil 7, Year 10)

This may indicate a loss of identification of humans with other animals and a therefore a distancing between humans and environment. Of the eight Year 10 pupils, who did refer to humans, only three pupils retained 'humans' in their statements; two had written about environmental issues in Year 9, two had written biological/physical component descriptions with a simple link to abode in Year 9. There was an increase in references to environmental issues, primarily pupils who had referred to humans in the previous year.

A considerable change in response composition was seen between Year 10 and **Year 11**. The proportion of responses that involved descriptions of environment that did not include humans was higher than in any of the previous years. Even taking into account any comment with a human-link (such as man-made items), only 23% of the cohort referred to humans in their written concept.

Following cohort A over the four years, it can be seen that there were two jumps in the presentation of quite limited concepts (statements falling into codes 1 to 4 inclusive on coding frame 1) of the term 'the environment'. In Yr 8 this value was 37% of cohort A, rising slightly in Yr 9 (coinciding with ecology teaching within the KS3 science curriculum) to 48%. In Yr 10 this value fell again (39%), before rising in yr 11 (at the time of G.C.S.E. ecology teaching in the Biology curriculum) to 77%.

The ways in which **'humans'** were incorporated into pupils' conceptualisations of 'environment' fell in to four main categories (Figure 10). All three cohorts completed this task in Year 8 before the end of their autumn term. At this point, the pupils had not had overt EE provision in any of their curriculum time at the case study school. Consequently, a large

proportion of the information held in the construct they indicated on paper, would have been influenced by experiences prior to joining the case study school.

Figure 10 – Concepts of 'human' inclusion in 'environment'

Humans as:

- depending on or being affected by conditions within the environment
- negatively affecting components of environment
- taking a stewardship type role in caring for components of environment
- integral parts of 'environment'

The pupils came from a wide variety of 'feeder' schools and the type and degree of EE provision would be just as varied. The ***sub-groups*** (those who included humans in their written conceptualisation) of pupils were categorized by feeder school to expose any relationship between the two (Appendix II).

The compositions of cohort A pupils' conceptualisations were tracked over the four years to see how individuals changed their responses. The sub-group who included 'humans' gradually stopped doing so over the 4 years. Four of the Year 8 sub-group continued their inclusion through to Year 9; the other seven went on to write much narrower Yr 9 statements that suggested a more basic ecological conceptualisation. Only three of the Year 9 sub-group continued through to Year 10 and only one of those continued to include 'humans' in her conceptualisation in Year 11 (Appendix III). As cohort A moved from Year 8 to Year 11, the size of the sub-group fell by over two-thirds (table 8).

Table 8 – 'Human inclusion' written concepts for cohort A

Year group of cohort A	cohort A size (N_{tot})	% of cohort including humans in their written concept (sub-group X)	% of sub-group (X) using humans in concept for this time only
8	27	48	38
9	27	41	56
10	24	33	25
11	26	15	0

This decline in the sub-group size was not statistically significant from one year to the next (using continuity correction, all values of $p > 0.16$), however, when comparing Yr 8 to Yr 11 the overall drop was statistically significant:

chi square value calculated = 5.109 (using continuity correction)

asym sig (2-sided) = 0.024 $p<0.05$

In summary, the overall decline in inclusion of 'humans' in the pupils' conceptualisations of 'environment', from Year 8 to Year 11, is statistically significant.

Cohort B's **Year 8** sub-group, referred to 'humans' in a way that inferred 'dominion' compared to that of age-equivalent cohorts A and C. Both cohort A (11%) and cohort C (3%) had pupils responding with statements that included humans within the fabric of environment (*'it includes people'*). In addition to this, pupils in both these cohorts made references to humans being affected by occurrences in the environment; this implicit reference to a relationship between environment and humans was made by 11% of cohort A and 14% of cohort C.

Only 38% of the sub-sample in cohort A and 36% of the sub-sample in cohort C made references to humans' stewardship of the environment. This was in contrast to the overwhelming connection that the cohort B sub-sample was making between humans and environment, that of humans as caretakers (90% of sub-sample), or stewards of nature:

'I think and understand that 'the environment' is where we live and our surroundings. It's also what state the land is in and we have to take care of it so we can live in it happily with animals. We also need to prevent pollution' (Cohort B, Pupil 7 ,Year 8)

'To me the environment is the world around us. It includes caring for animals and plants and we should look after it and not use its resources' (Cohort B, Pupil 23, Year 8)

There was a much larger reduction in the use of 'humans' in cohorts B and C's freewriting responses in **Year 9**. Cohort B's sub-sample size fell from 38% in Year 8 to just 4% in Year 9. The single pupil, who made up the sub-sample in Year 9, had not done so the previous year; their reference was to the role of human as steward in 'taking care of' the whole of our natural surrounds. Cohort C s sub-sample fell from 38% in Year 8 to just 11% in Year 9. Of the Year 9 sub-sample 7% had also made reference to humans in Year 8; however, they changed their approach from that of human impact to that of responsibility to care for the environment.

The statements written by the sub-sample in **cohort A**, Year 9, fell, almost equally, into two main areas, those with some form of human 'action' on environment (whether impact or stewardship) and those with simple inclusion of humans in the 'fabric' of environment. Cohort A's sub-sample fell from 41% in Year 9 to only 29% in Year 10. Half of these responses were coded under categories that identified inference of humans' environmental stewardship role. The responses made reference to conservation, care of the environment and humans' capabilities in manipulating and changing the environment. The proportion of the sub-sample that made a simple reference to the inclusion of humans within the 'fabric' of environment was lower (38%) than the previous year. The number of human inclusion declined again in Yr 11 with the sub-sample consisting of just 15% of the cohort. Now 75%

of the sub-sample wrote simple statements that suggested inclusion of humans in the 'fabric' of environment.

The two coding frames are constructed such that the first frame concentrates on the *objectifying* of environment, by referring to things found in it and the existence of environmental issues. The second coding frame concentrates on the inclusion of humans in their construct in such as way that a *relationship* is inferred. Table 9 summarises the key category approaches taken by the pupils in the study in their written expression of their concept of 'environment' (the numbers are the sub-sample size). It appears that in all cohorts and in every year, the number of pupils expressing an objectifying concept of environment outweighs those that express some degree of a relationship between human and non-human aspects of environment; showing some similarities to the results of the study by Loughland *et al* (2003). It is clear that, as pupils move from one year to the next, the objectification of environment increases. As previously discussed, this happens much more quickly with cohorts B and C than with cohort A.

Table 9 – Summary of concept categories for 'environment'

		Cohort school year				
Cohort	Concept Category	8	9	10	11	Total responses
A	Object	14	16	20	22	72
	Relation	13	11	8	4	36
B	Object	16	26	*	*	42
	Relation	10	1	*	*	11
C	Object	18	25	*	*	43
	Relation	11	3	*	*	14
Total responses	Object	48	67	20	22	157
	Relation	34	15	8	4	61

* - did not carry out freewriting in these years

To summarise:

- Approximately a third of each of the cohorts (almost half in Cohort A) included 'humans' in their written conceptualization during their Yr 8 academic session –i.e. sub-samples are large in year 8 in all three cohorts
- Pupils who included human management of nature in their freewriting, referred to stewardship rather than dominion over nature; a tendency identified by Habgood (2002) –Only one pupil[13], in Year 8, used words that could be interpreted as alluding to dominion. She wrote how the environment can change dramatically *when humans take charge*. When asked, a few days later, to elaborate, although very nervous, she did indicate that she thought in some case humans try to *take control of* and *act on* the environment to its detriment, referring to deforestation. It was clear that she was not advocating this approach and coding reflected *human impact* on environment.
- When the sub-samples of all three cohorts were analysed, there did not appear to be a relationship between feeder school and the individuals making up the sub-sample (Appendix VI). The only two feeder schools to respond to inquiries about EE provision indicated that there was no organised school wide approach, that it was subject to teacher preference.
- In cohort A, the inclusion of humans in the written conceptualisations of 'environment' by pupils declines over the four years. This suggests an increase in the objectification of the pupils' conceptualisations of environment as they move through this secondary school.
- As has been identified, all three cohorts had similar sub-sample sizes in Year 8. Significant declines in sub-sample sizes can be seen within one year for cohorts B and

[13] Sandra – one of the secondary key informants – see section 4.5

C. However, this does not occur with cohort A. Cohort A was the only cohort of the three to participate in the EE trip at the end of Year 8, which may account for the sub-sample remaining high at the beginning of Year 9. The EE provision at the case study school was altered over a number of years. A reduction in provision might be contributing to differences seen from cohort A to the two successive cohorts.

4.4.2 Question 2 - What issues are of importance to you and *why*?

Research has identified a lack of concern in youths for many environmental issues that do not seem to bear any relevance to the individual, whether to geography or scale (see section 3.2). Pupils at the case study school had intimated similar feelings during informal discussions, although actual concerns were not consistent from one year to the next. Media coverage may be contributing to this variation and is a consideration that both primary and secondary key informants refer to, in interview, as influencing their environmental considerations (Chapter 5).

The second question, in the freewriting task, was asked in order to shed some light on the pupils' environmental concerns at the time of participating in the task. Any changes in concerns would become apparent from the pupils' written responses over successive years. Rather than presenting a pupil's developing conceptualisation (cognitive based), this second question asked for responses that would be more overtly influenced by their feelings. Pupils were asked about their concerns; consequently, the response would be tapping into the affective domain.

Two approaches were taken towards analysis of this second question. Firstly, the responses produced by the pupils were examined for named environmental issues. These were tallied for cohorts in each of their years. Using a geographical-ranking system (see section

4.2.2.1), the change in issues named by the cohort could be tracked from one year to the next. Secondly, the same responses were coded using two frames that were used to allow a degree of sorting in relation to time and geographical scale (see section 4.2.2.3)

4.4.2.1 How global is local? – A ranking issue

The significance of a multiplicity of selves in human beings makes it difficult to perform tasks such as ranking the environmental issues, within the freewriting, from local to global in applicability. On the surface, it appeared to be a simple listing of issues based on an objective rationalization of the geographical impact of each issue. For example the issue identified as *'Personal electricity conservation'* refers to statements made by pupils with respect to turning lights off when leaving the room. This, initially, seems like a clear 'local' issue. However, consider the ramifications of this action. By reducing personal electrical consumption national electrical consumption is influenced, as is global consumption of fossil fuels. A second example is ozone depletion. This occurs on a global level, the ozone layer knows no international boundaries. However, certainly, particular countries can be affected more than others at particular times of the year and so it could be considered national in effect. To take this further, thinning of the ozone layer leads to warnings to specific populations to increase their sun block activities, specifically due to the health effect at the local level – that of the individual. The multiple approaches to environmental issues (Bonnett, 2003a) are clearly identified in an email communication by one of the case study inter-reliability coders contributing to the validity of the final ranked list of issues:

''I found this quite difficult. I could change the order several times a day depending on how I am feeling, whether it is raining, what is on the news, what I had for breakfast, where I fancy going today or next week....'

Indeed, the rank list is contingent on educational context; it was constructed for use within a finite period of time and with a particular group of pupils based on their responses. I knew this cohort quite well, as tutor and then teacher I was able to produce the rank list, a list that would not necessarily have been the same if a non-western teacher, with no experience of these pupils, had attempted its construction. Upon further discussion, the coder (quoted above) agreed that grouping of certain issues into general levels (local, national, global) was less problematic, it was the specific ordering within levels or on the boundary of levels that proved more difficult. The fine details of the ranking will be subject to change from time to time, nevertheless, the overall trend of issues is in line with the applicability of issues in the context of school learning (DfEE, 1999b). Recycling and energy consumption are taught and recalled in the context of personal use influencing national consumption and, consequently, are situated down at the local to national level. In classroom discussion and interviews pupils indicated difficulty in connecting with the 'big' issues (section 4.5.4), these being identified at the international/global level of applicability, such issues *'...are 'global' in their scope (which is not to say they affect all places and people on the planet equally)'* (p95, Barry, 1999).

Taking into account the limitations of the ranking of these issues the process is, nevertheless, useful in demonstrating the general shift in the loci of environmental concerns, spontaneously recalled by pupils as they move through their adolescent years.

Checker 2 and myself ranked the list of environmental issues that emerged from the pupils' statements, separately. When the lists were compared for validity, 63% of the statements were within at least 3 positions of each other on a linear scale. I reviewed the two lists and constructed a third (compromise) rank list. Checker 2 reviewed this list and agreed that, as far as was possible, the list represented a general trend from more local to more global

issues. This list (Appendix IV) was used to plot bar charts of the distribution of responses given by the pupils in all 3 cohorts over the 4 years (Appendix V). Block black arrows have been used to highlight the general shift. Counts made for environmental issues referred to in the pupils' statements were checked for reliability.

4.4.2.2 Distribution of pupils' environmental concerns

Appendix V illustrates a general shift in environmental concerns expressed by **cohort A** pupils as they move from Year 8 to Year 11. The shift from left to right on the four graphs, suggests a move from an emphasis on more local concerns to those considered more global.

In Year 8, 42% of the pupils' references to environmental issues came from the first half of the ranked list (Appendix IV). This proportion dropped in Year 9 to 30%, and again in Year 10 where only 4% of references to environmental issues were considered local and national. In Year 11 there was a small rise back to 8% of the comments coming from the first half of the list. This shift shows increasing reference to global issues as the pupils move through secondary school, a change that is seen in other studies concerning junior high school pupils (Tung *et al*, 2002).

In Year 8, more locally applicable issues such as *graffiti and vandalism*, *water conservation* and *electrical/energy conservation* are referred to, but then do not appear in responses in any other year.

By Year 9 the distribution had shifted from within the lower range, to that showing mid and high range clusters. It is in this year that this cohort showed a peak in the number of references to *rainforest* degradation (26% of Year 9). This coincides with a point in the academic year when the pupils had recently completed a rainforest project in Key Stage 3 geography.

The proportion of this cohort referring to *pollution* fluctuated only slightly - 56% in both Years 8 and 9, 46% in Year 10 to 62 % in Year 11. By the completion of the task in Yr 11, 27 pupils ($N_{\omega t} = 28$) had made reference to *pollution* at least once in the four years. This could be considered a 'catch-all' statement used by pupils, without being contextually specific; pupils are able to express a more general concern using a widely accepted term.

One pupil did not refer to pollution in any of the four years of the task. She had made reference to a concern for wildlife in Year 8 but had gone on to show her reservation for 'conservation' actions in Year 9, by commenting on the need for caution in the introduction of animals and plant species. Her remark called for care that *'... the balance is correct... '* and was qualified by stating that *'... generations want to see the environment how it always has been, not how we have made it!'*. This response suggests an incomplete understanding of the influence humans have had on their surroundings; she describes a precautionary approach to human interference, suggesting an assumption that there are areas that have existed free from such influence over long periods of time. In Year 10 and 11 she concentrated on environmental issues that were focused on concern for human welfare; in Year 10 she referred to *women's rights* and in Year 11 she wrote of her concern for *homeless people*.

In Yr 10, whilst all references to factors such as *cleanliness/aesthetic values, drugs, car use* and *animal testing* stopped, *acid rain* was referred to for the first time in this cohort, with it's most frequent reference occurring in Year 11.

The numbers of pupils including *ozone depletion* in their written statements fluctuated only slightly. During the four years, a total of 18 students made reference to *ozone depletion*.

The numbers of pupils referring to *global warming/greenhouse effect* in Year 10 and 11 were more than double of those doing so in Years 8 and 9.

During their Year 8 task **Cohort B** referred to fewer issues than cohort A, however, the distribution of issues on which they commented was similar in Year 8 (Appendix V). However, the reduction in references made to environmental issues coming from the first half of the rank list (from Year 8 to Year 9) was greater in this cohort than that seen in cohort A. By Year 9 only 13% of cohort B written responses were coded as coming from the first half of the rank list (local and national issues).

In contrast to both these groups, **cohort C** showed the reverse in terms of the shifting of their written environmental concerns. In Year 8, 14% of the concerns identified by cohort C pupils came from the first half of the rank list (local, national). However, in Year 9 this increased to 37%. This cohort had been involved in a process of reflection, on personal and school environmental behaviour during the Spring of their Year 8, which had not taken place with the previous two cohorts. It should be noted that this cohort behaved differently during the process of completing the task. In Yr 8, they had completed the task without talking and in a very similar manner to the other two cohorts. However, this cohort had become much less reserved than either of the other two cohorts, and they did not complete the task in Yr 9 in the same restrained manner. A number of students asked questions throughout the task such as:

- *'What kinds of things do you want us to say?'*
- *'What, like recycling and stuff?'*
- *'I remember doing this last year, are you seeing how good we are?'*

I assured them there were no right or wrong answers, as I had done with the other cohorts. However, it was my impression that the atmosphere in the classroom may have affected the spontaneous and personally truthful nature of the responses. This type of 'outburst' from certain pupils in this class was referred to, in interview with one of cohort C, a year later. Lori

(cohort C) was interviewed in relation to specific environmental education provision given to Yr 8 and Yr 10 pupils in 2002 (see section 5.4). During this interview she explained the powerful nature of such interruptions by these students, their linking of environmental issues from one subject to the next, and how personal knowledge and understanding was affected.

4.4.2.3 Temporal-Proximity Placement

The second question in the freewriting task was also analysed for the expression of timescale and geographical scale, that is to say temporal and proximity codes were assigned to each pupil's statement. The coder read the pupil response as a complete statement, initially, and then focused on the sense of timescale that 'emerged' from the writing. The same process of 'holistic immersion' in the text was used with ascribing a proximity code.

The temporal code was kept down to a choice of three. The passages written by the pupils were searched for a sense of immediacy, in using the present sense and talking in the very short term or the use of words that conveyed a sense of future, a long-term projection with respect to environment issue impact.

The proximity coding frame attempted to distinguish the spatial dimension of environmental attitude (Syme, *et* al, 2002) by the pupils' use of specific environmental issues. The rank list produced earlier (see section 4.2.2.1) was used to provide examples to aid the coding process. The frame allowed codes to be given to merging boundaries between local/national and national/global. The extreme merging of local and global would not code and required the researcher to re-read the passage to search for the pupils' emphasis. There were code options for the researcher being unable to place the statement into a proximity or temporal location.

The coding allowed the statements to be located on a ***temporal-proximity grid***. This was based on the grid design of the '*Human Perspectives, space-time graph*' presented in *The Limits to Growth* (p19, Meadows *et al*, 1972). Using a form of bubble graph, circles plotted on a 3x5 grid could place the pupils based on their coded responses for statement 2; the diameter of a bubble indicating the number of pupils given that particular code. The aim was to use the evidence presented by the pupils, in Cohort A, to illustrate the distribution of their concerns as they moved through the first four years of the case study school education system. It would only be possible to compare the first two years within cohorts B and C.

The temporal-proximity grid for **cohort A in Year 8** (Figure 11a) shows a cluster of responses that are coded within a *short-term* temporal situation. That is to say the statements were coded as primarily about the *'here and now'*, by use of tense and expressions in the complete statements, e.g.:

'I think far too many people drop litter and cause to much pollution. I also think that people abuse the land like using it for dumping rubbish when instead we could recycle it. When trees are cut down I think at least one should be planted.'[14] (Pupil 1)

Over 60% of the students are coded at this temporal locus. However, their proximity locus is distributed across the range from *local* to *national/global*, with a peak in *local/national* issues. Thirty percent of the students wrote statements that expressed concern for *national* and *global* issues within a more *medium term* time frame, that is over the period of their life moving in to their children's' lifetimes, e.g.:

'Issues such as pollution are very important to me and other people. No-one wants the earth to be polluted, but so many people do it these days. Other than that I think there are no major

issues on environment an none important to me now but in the future I think there might be.'

(Pupil 20)

A small proportion (8%) of the cohort expressed *national/global* issue concerns that indicated a sense of *long-term* environmental considerations, e.g.:

'There are lots of issues which concern me, including: global warming, the ozone layer, and de-forestation. Out of all of them, de-forestation probably concerns me most, as once all the trees are gone, so, probably, will the animals and birds which depend on them, and humans also.'

(Pupil 17)

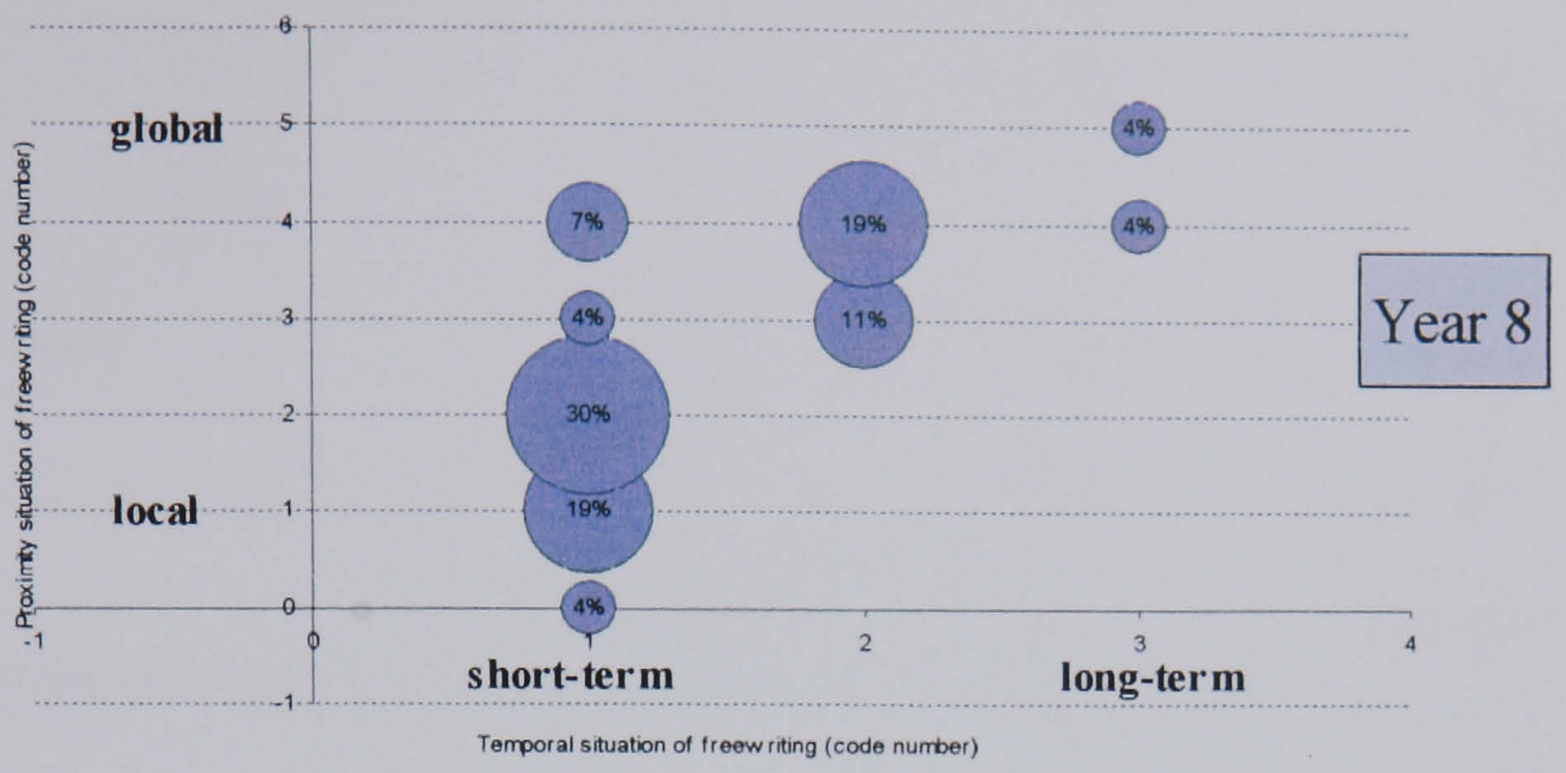
There is a shift in the placement of pupils in the grid when statements from **cohort A, Year 9**, are coded using the same coding frames (Figure 11b). The proportion of pupils that respond with statements that are placed in the *short-term* locus falls by approximately half, those coded here are evenly distributed across *national* and *national/global* concerns. There is translocation of pupils to a more *medium-term* placement, with concerns for environmental issues that span the proximity scale, but with a peak across the *national/global* boundary. Figure 11c illustrates the relative placements of temporal-proximity coding given to statements written by pupils in cohort A in Year 8 and Year 9. All 27 pupils responded in both years 8 and 9.

The terms *positive* and *negative* have been used to describe the migration pattern of pupil responses – this denotes the direction of movement along the numerical axes and does not indicate more or less positive environmental attitudes.

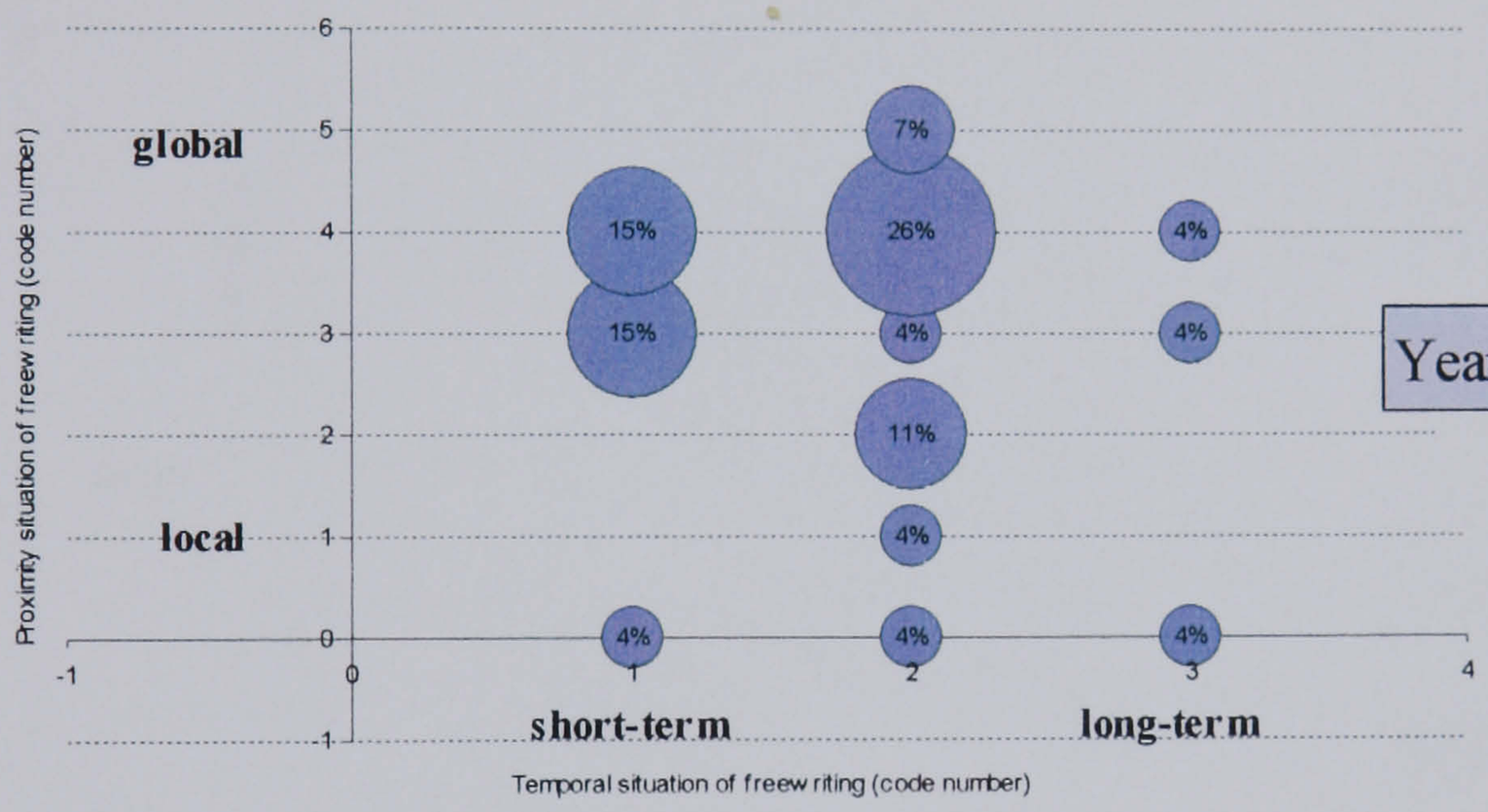
[14] Spelling and grammar for all statements quoted has been retained as in the students' originals

Figure 11 - Temporal Proximity distributions of statements made by Cohort A - during Years 8 and 9

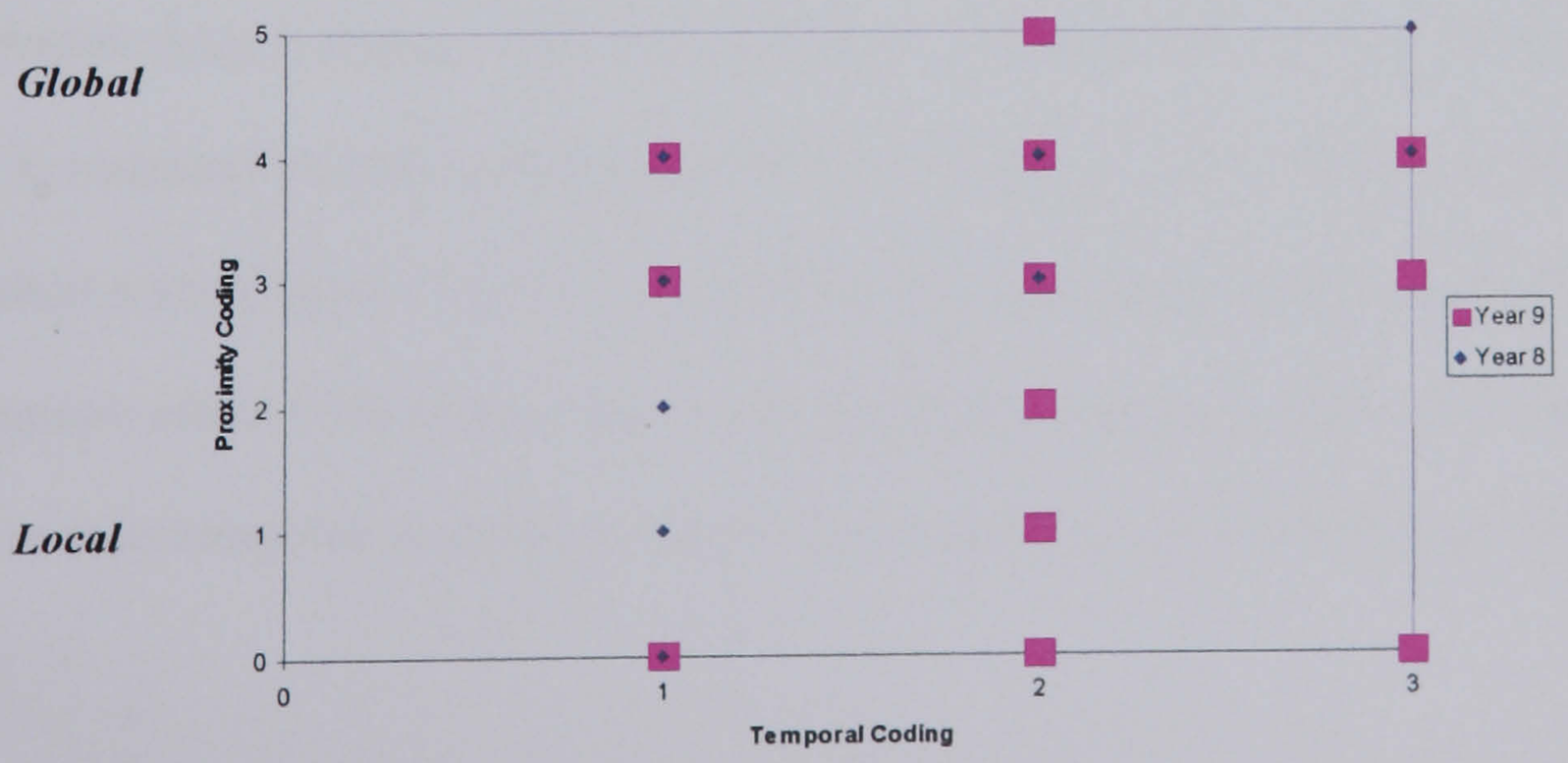
a)



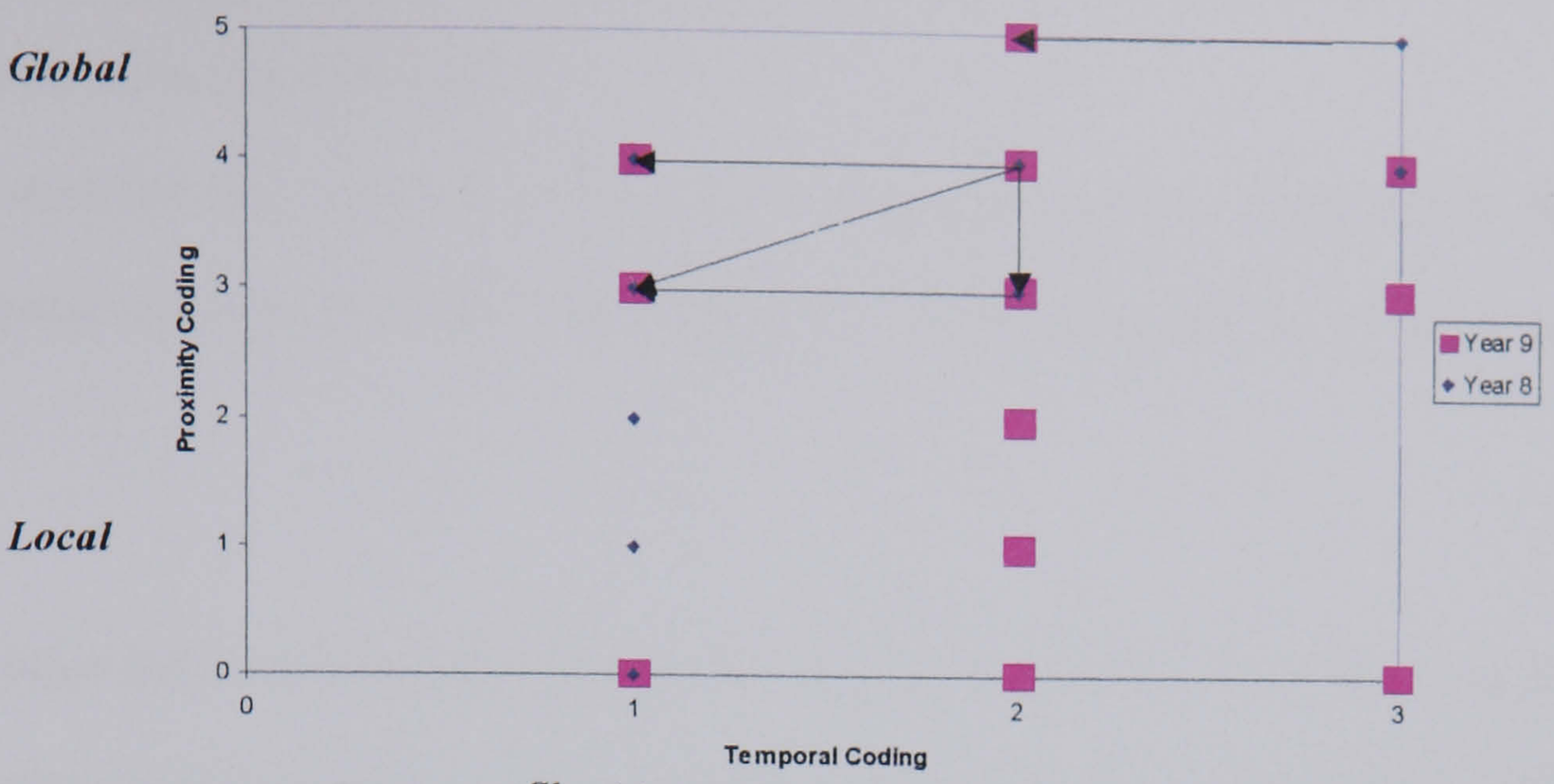
b)



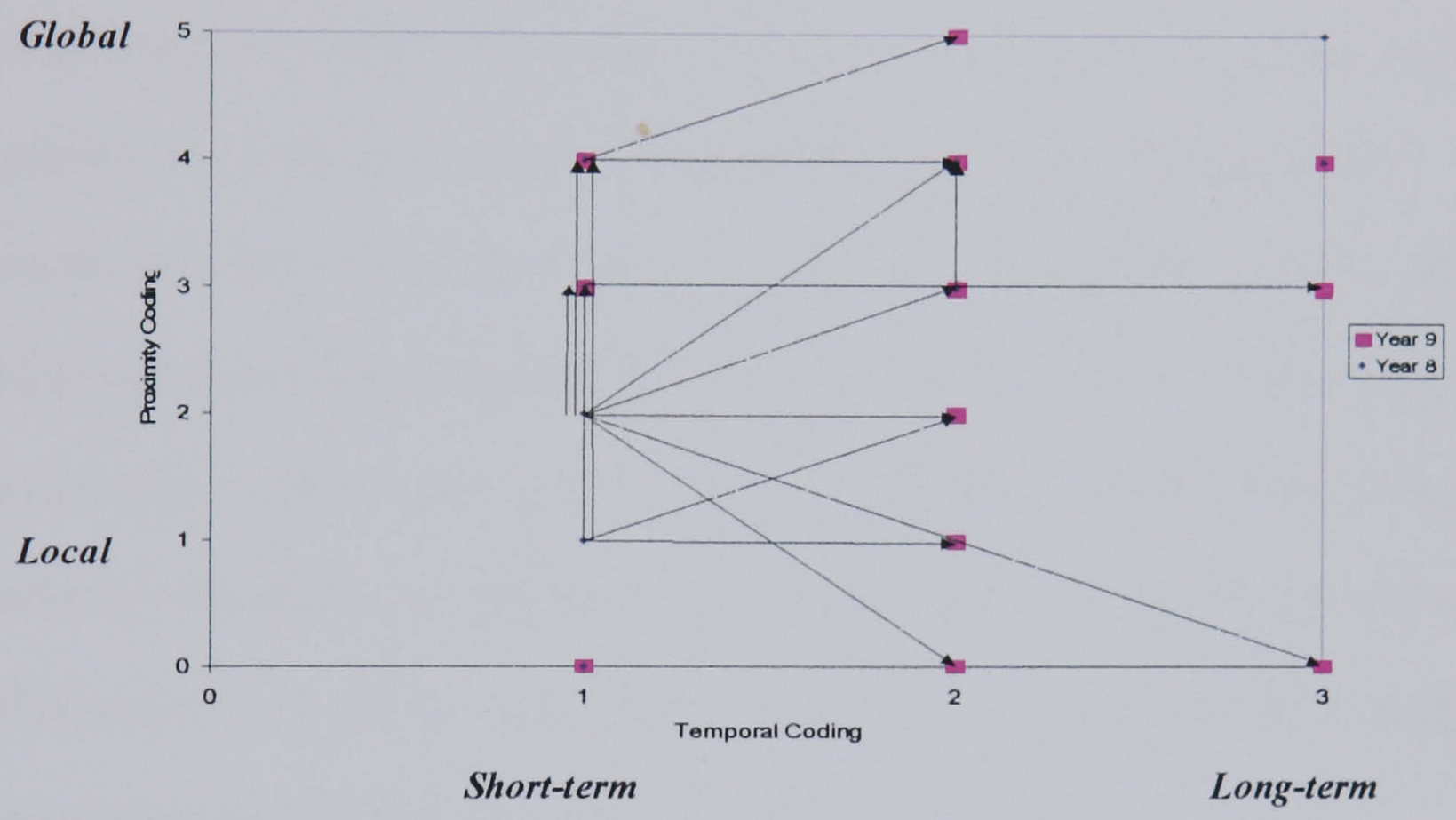
c) Positions of pupil statements-cohort A temporal-proximity coding - Year 8 to Year 9



d) Negative migration statements-cohort A temporal-proximity coding - Year 8 to Year 9



e) Positive migration of cohort A temporal-proximity placement from Year 8 to Y___ .



It was possible to track individual pupils to show their shift in temporal-proximity placement. Approximately 18% of the cohort wrote statements, in Year 9, that suggested a shift in temporal-proximity placement to a lower value, towards the left of the grid, more local and short-term (Figure 11d), 15% wrote statements that suggested no change in their placement, whilst 67% of the cohort wrote statements that were coded such that a 'positive' shift in their temporal-proximity concern was suggested. This shift or *migration* is detailed in

Figure 11e. The arrows show the directional shift of statement coding for these pupils (broader arrows denote more than one pupil).

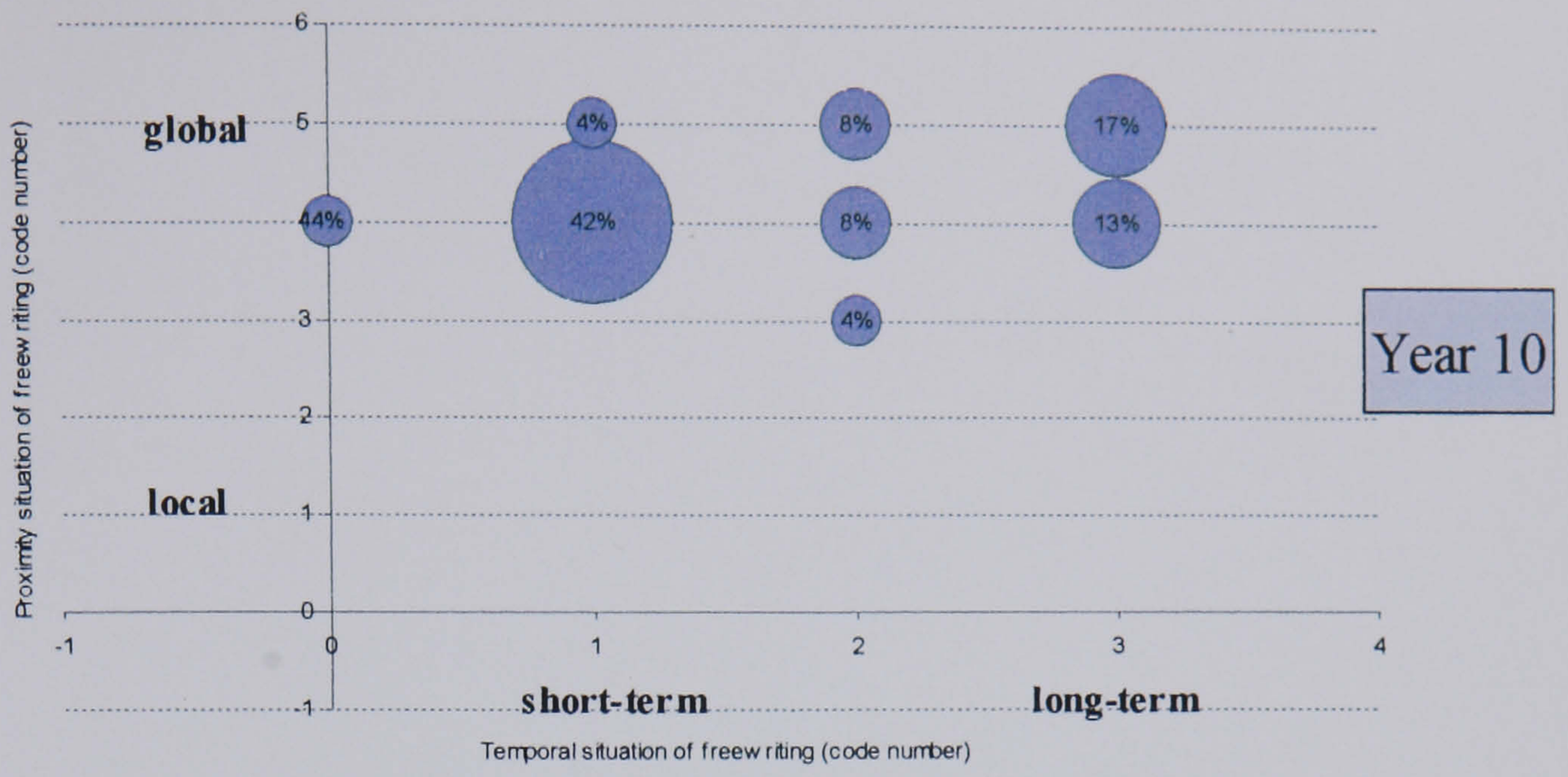
In summary the overall *migration* is to the right and upwards, suggesting an increase in the temporal-proximity of written environmental concerns as pupils move from Year 8 to Year 9.

Another shift is visible when **cohort A, Year 10**, statements are coded using the same coding frames and compared to year 9 statements locations (Figure 12a). In year 10, twenty-three pupils provided responses to question 2 of the freewriting task, the statements appearing to be more *national/global* in perspective than those given in Year 9 (Figure 12b). Just over 17% of the cohort were coded such that their statements suggested no change in their placement on the grid, 52% of the cohort wrote statements that suggested a *positive migration* of their written concerns across the grid (Figure 12c), the remaining 30% wrote statements that were coded such that a *negative migration* was suggested in their written concerns (Figure 12d). By tracking individuals across the both these *migration* grids it can be seen that there is a general shift upwards, i.e. concerns shift towards more *national* and *global* issues, away from issues that are ranked towards the *local* end of the proximity scale.

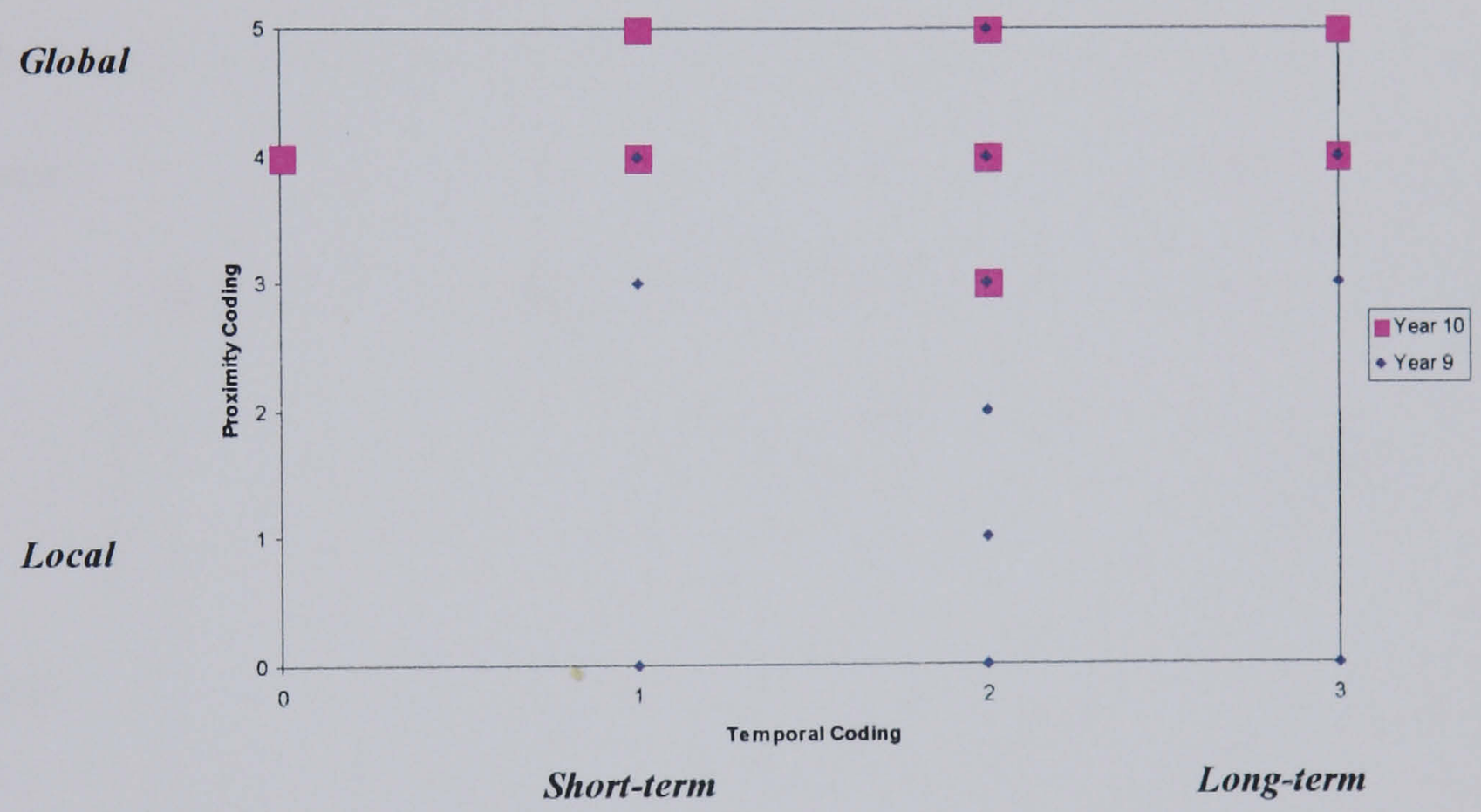
The *positive migration* (Figure 12c), involving over half the cohort also illustrates a shift from left to right, across the grid, a change suggesting increased concern over the *future* is expressed in the pupils' writing.

Figure 12 - Temporal Proximity distributions of statements made by Cohort A - during Years 9 and 10

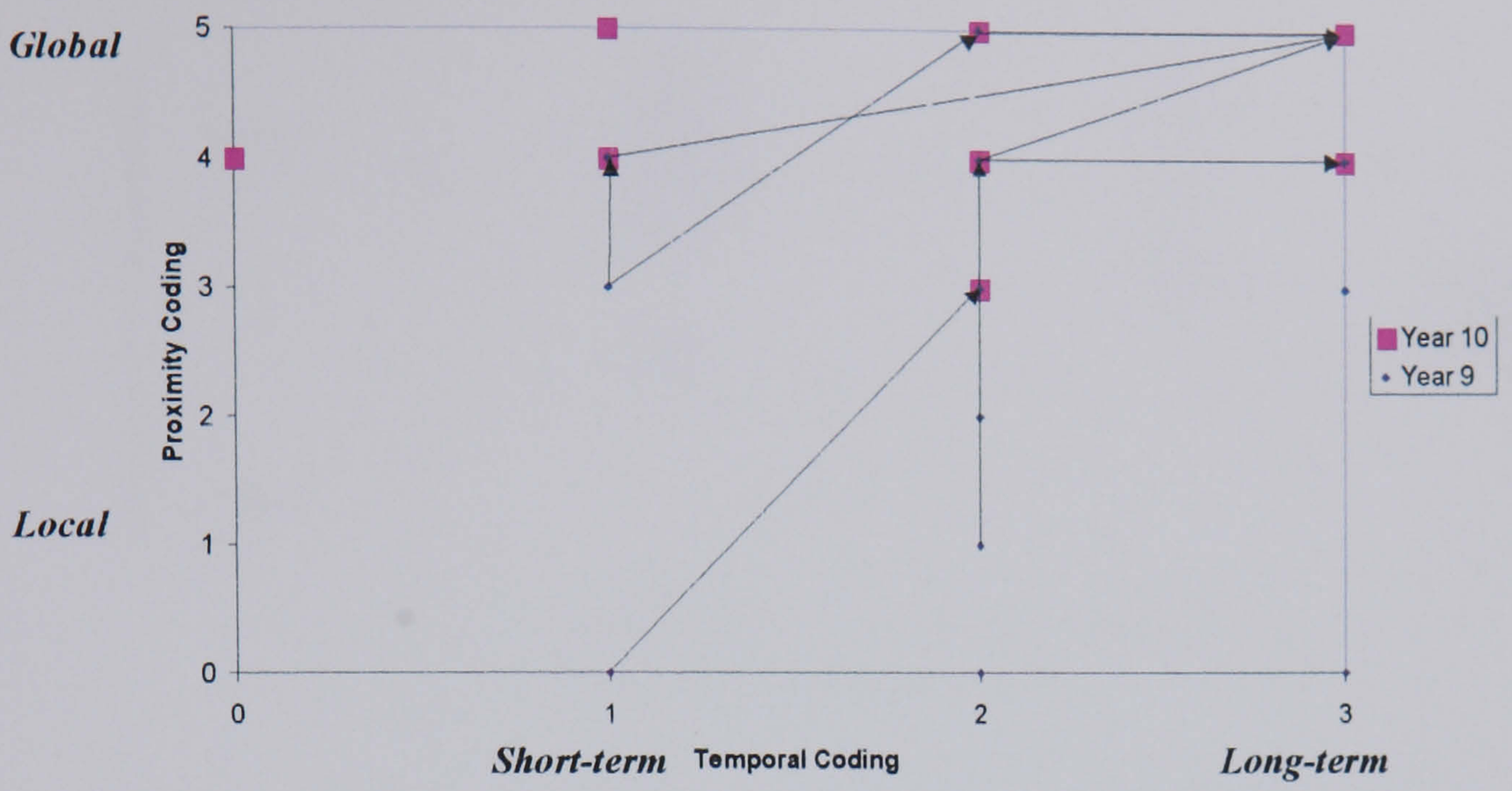
a)



b) Positions of pupil statements-cohort A temporal-proximity coding - Year 9 to Year 10



c) Positive migration of cohort A temporal-proximity placement from Year 9 to Year 10



d) Negative migration statements-cohort A temporal-proximity coding - Year 9 to Year 10

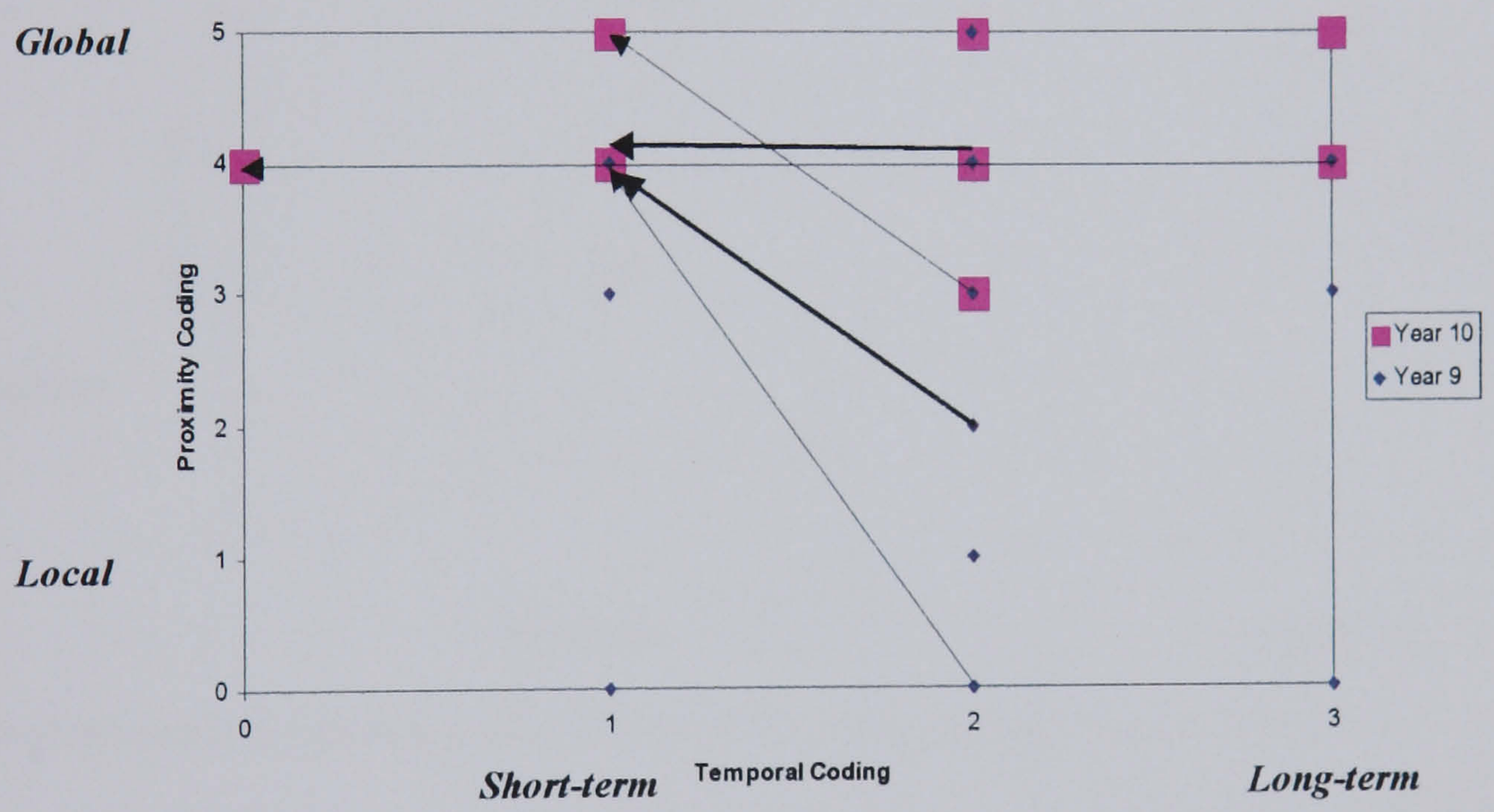
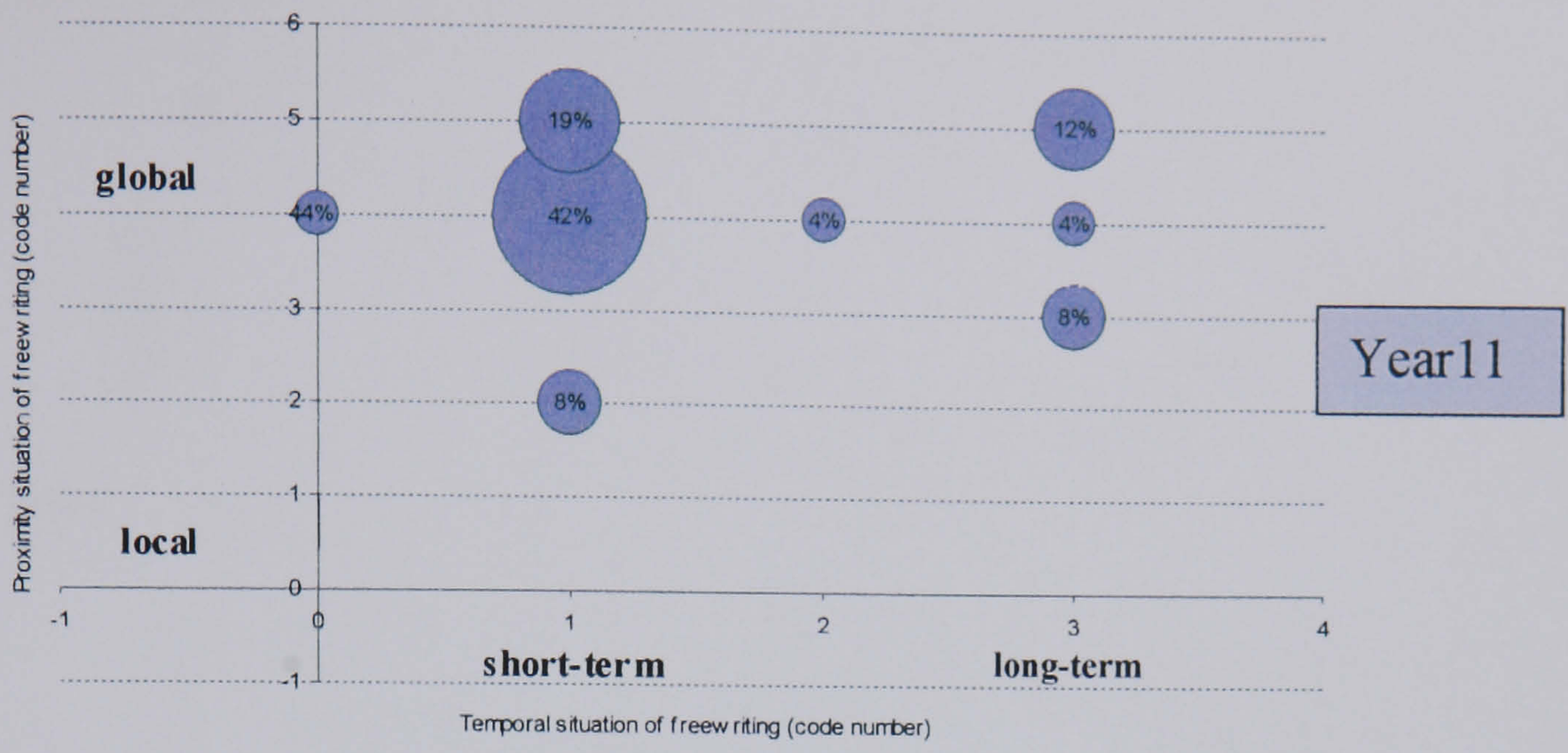
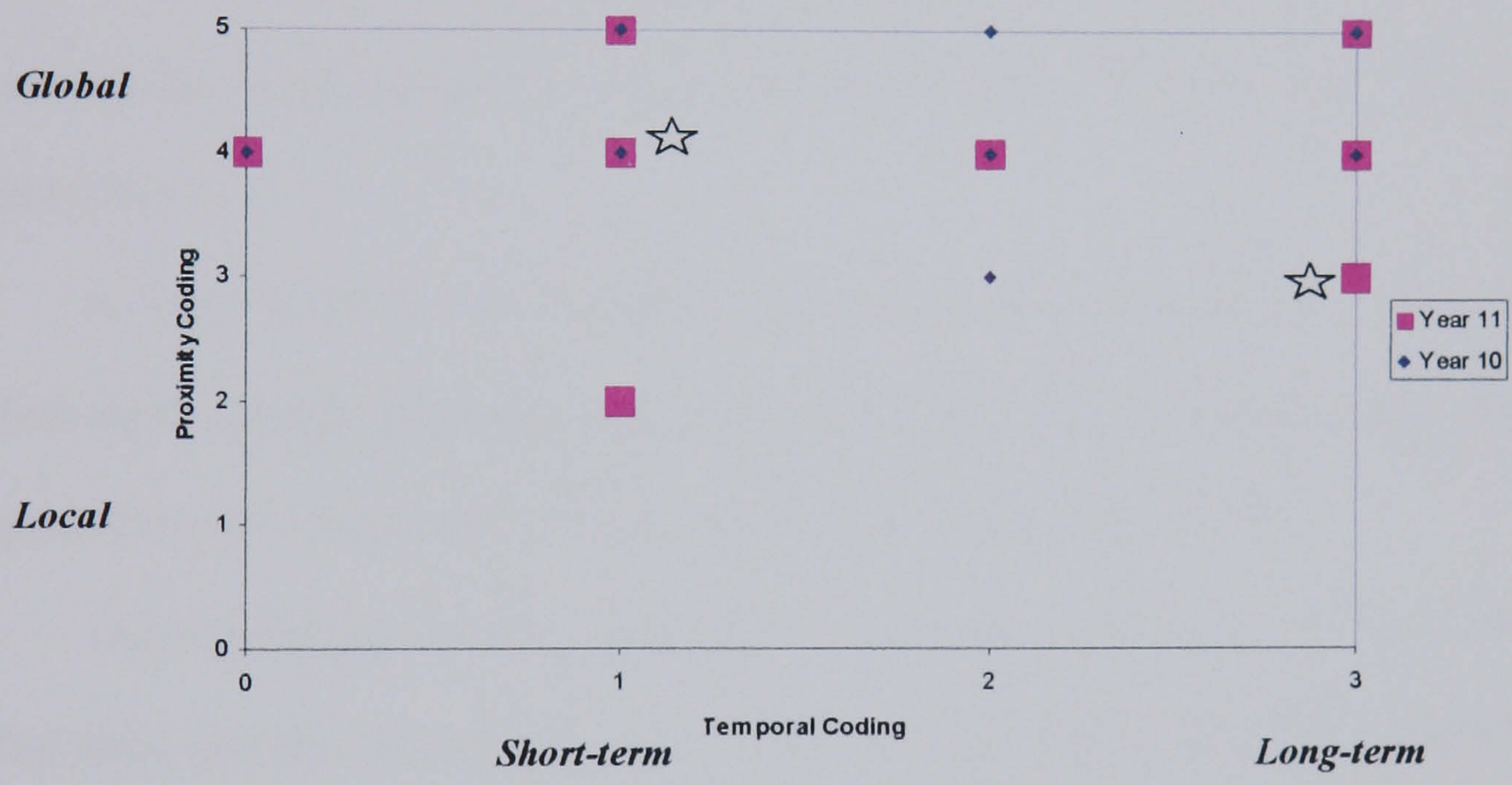


Figure 13 - Temporal Proximity distributions of statements made by Cohort A - during Years 10 and 11

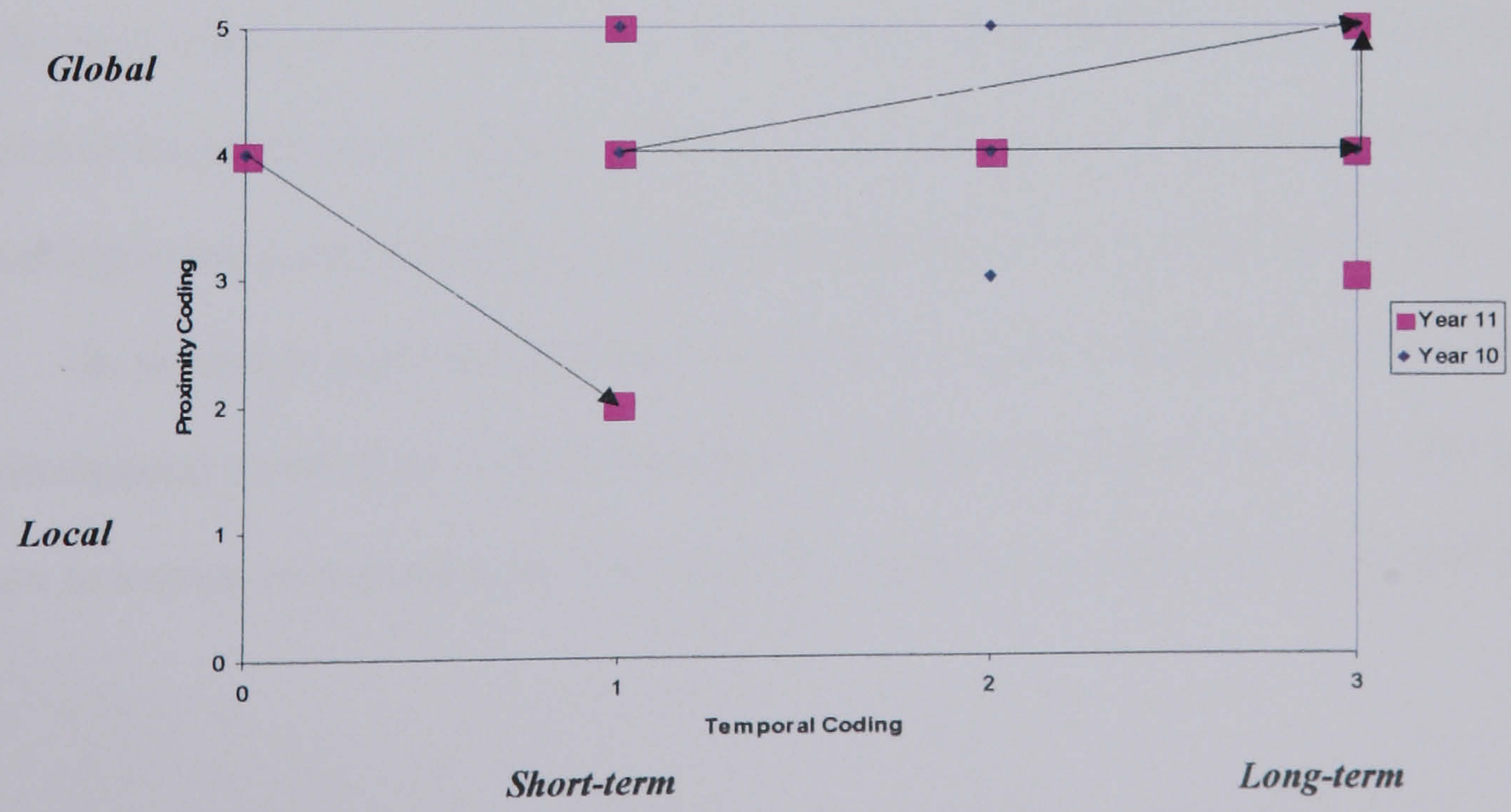
a)



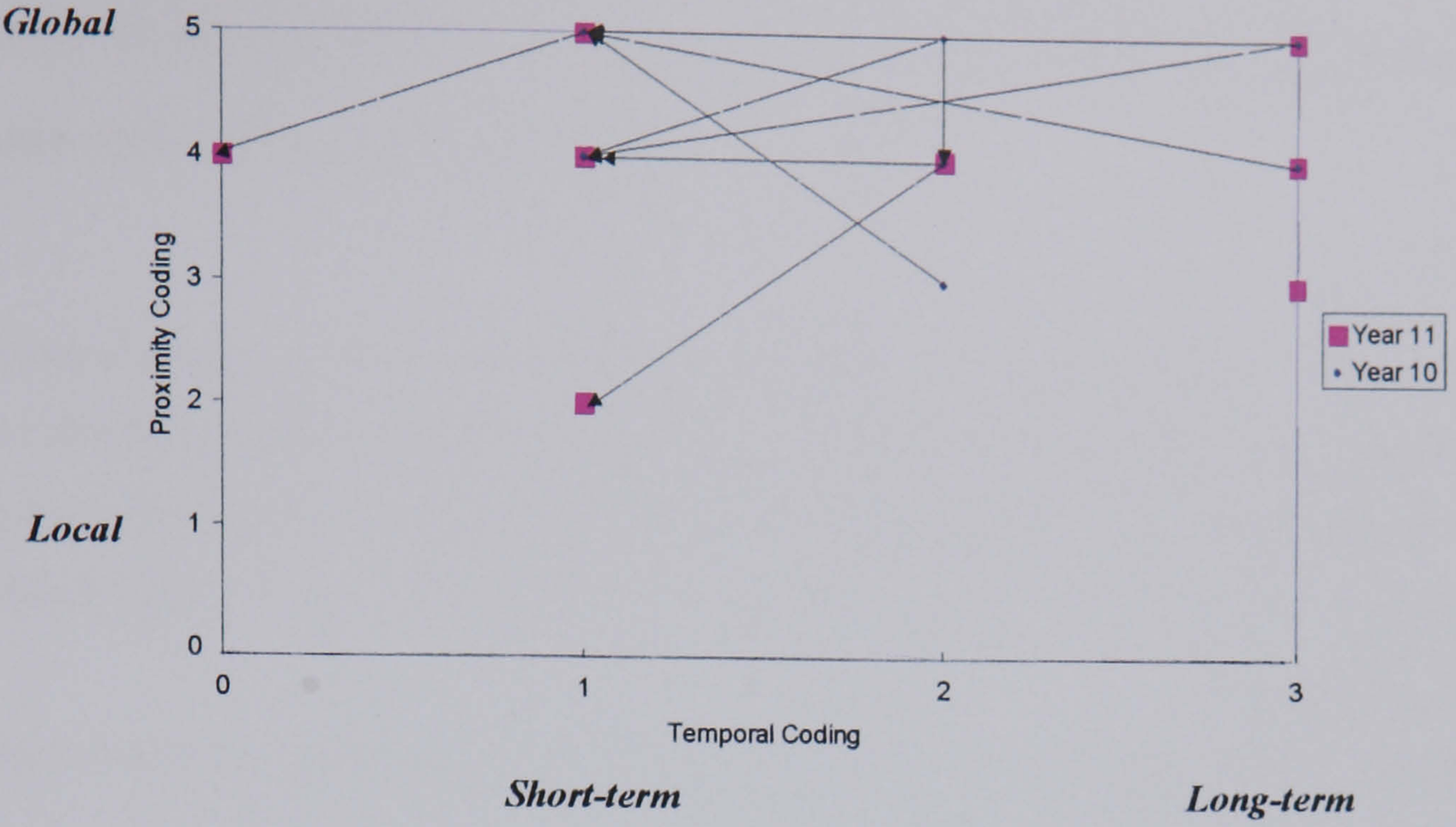
b) Positions of pupil statements-cohort A temporal-proximity coding - Year 10 to Year 11



c) Positive migration statements-cohort A temporal-proximity coding - Year 10 to Year 11



d)Negative migration statements-cohort A temporal-proximity coding - Year 10 to Year 11



[11% of Year 11 statements are not translocations - as there are no comparable Year 10 statements due to pupil absences, these are marked with a ☆ at the Year 11 location in Figure 13b.]

In Year 11, only 19% of cohort A wrote statements that suggested a *positive migration* in their environmental concerns (Figure 13c), whilst 27% did not change their placement, 42% suggested *negative migrations* in their written statements (Figure 13d).

The *dipolar placement* of statements is illustrated by Figures a, c & d, with *migration* taking place into the short-term and long-term; the distribution across the temporal coding has resulted in almost 70% of the class writing with a sense of short-term and approximately 24% of the class writing of environmental concerns with a sense of *future* impact. Generally, the *migration* has taken place within the upper portion of the grid, this suggests concerns are remaining in the *national/global* area and not returning to *local/national* placements.

In summary, pupils have moved towards more *global* indications in their written environmental concerns by Year 10 and this is further developed into Year 11, with a small return to a sense of immediacy in concerns.This migration in written environmental concerns,

from the more *local* concerns expressed in Year 8 through to, essentially, *global* concerns in Year 11 is not inconsistent with the EE pupils receive through, primarily, biological and geographical studies at the case study school.

I am concerned about the environment because it is important to look after it. Sometimes I think that I should do more for the environment but I think I do quite a bit. I don't like the idea of cutting trees down or destroying animals homes to build houses. I don't think that the animals should suffer because they have to lose their homes because we don't recycle enough.

(Pupil 12, Year 8)

Ozone layer. Acid rain – destroys trees and buildings, kills animals. Deforestation. Global warming.

(Pupil 12, Year 11)

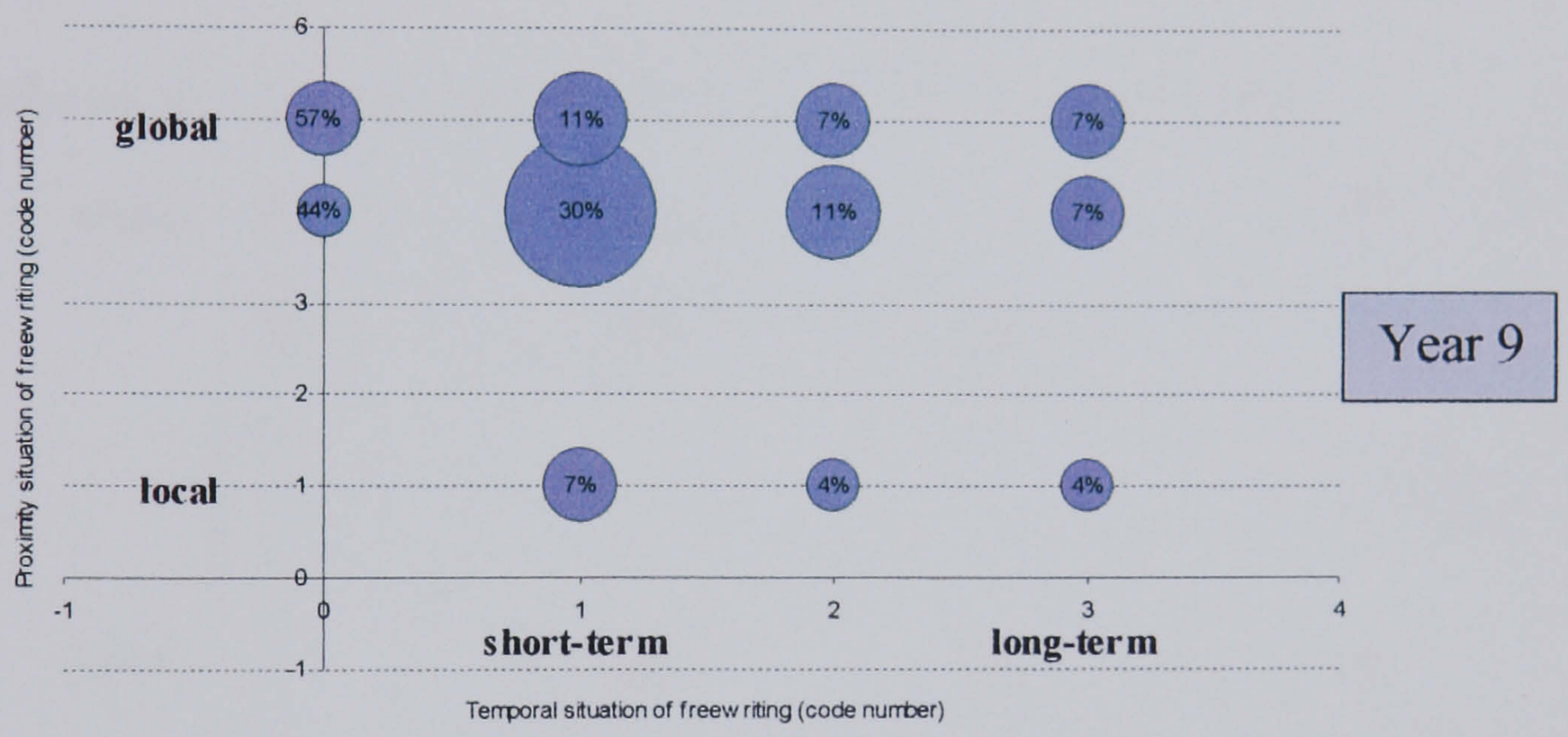
This *move away* from thinking about ***local future*** concerns in secondary age pupils is echoed in other research (Hicks and Holden, 1995).

Cohort B, Year 8, coded responses to question 2 suggested a greater spread of temporal reference within the class than that seen with cohort A in their Year 8 (Figure 14a). The proportion of cohort B, Year 8, responses coded with the temporal value *1*, was slightly less (50%) than that with cohort A Year 8 (63%). <u>All</u> of these cohort B pupil responses were coded with proximity values of *2 – 4*. With cohort A, Year 8, this proportion was 64%, whilst 30% of the responses coded *1* for temporal were also coded *1* for proximity. In summary, the distribution of cohort B responses, Year 8, showed slightly higher values for *temporal* locus than those given in responses by cohort A.

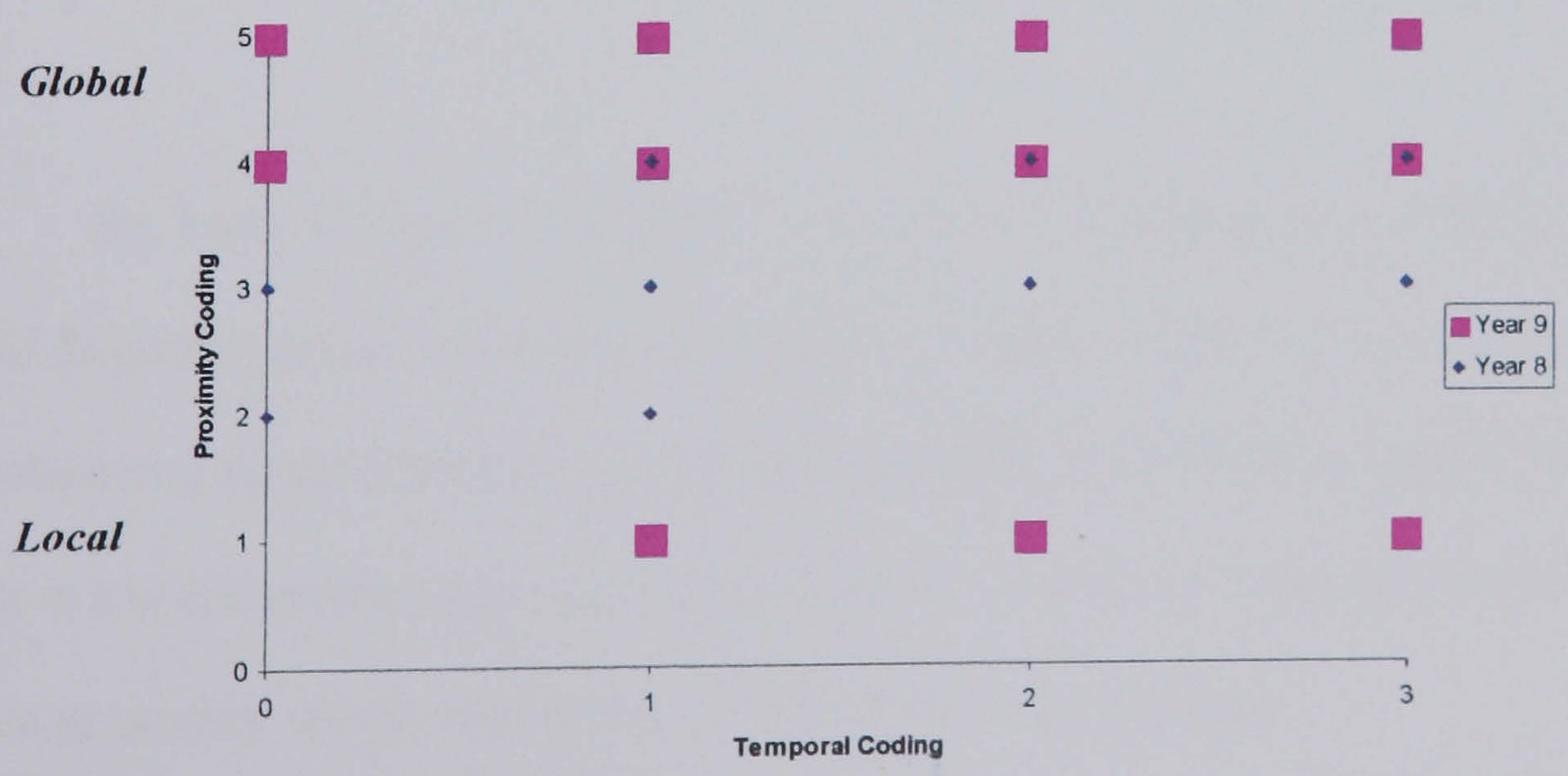
Figure 14 - Changes in temporal-proximity location of environmental issues concerns for cohort B over their two years of secondary schooling

a)

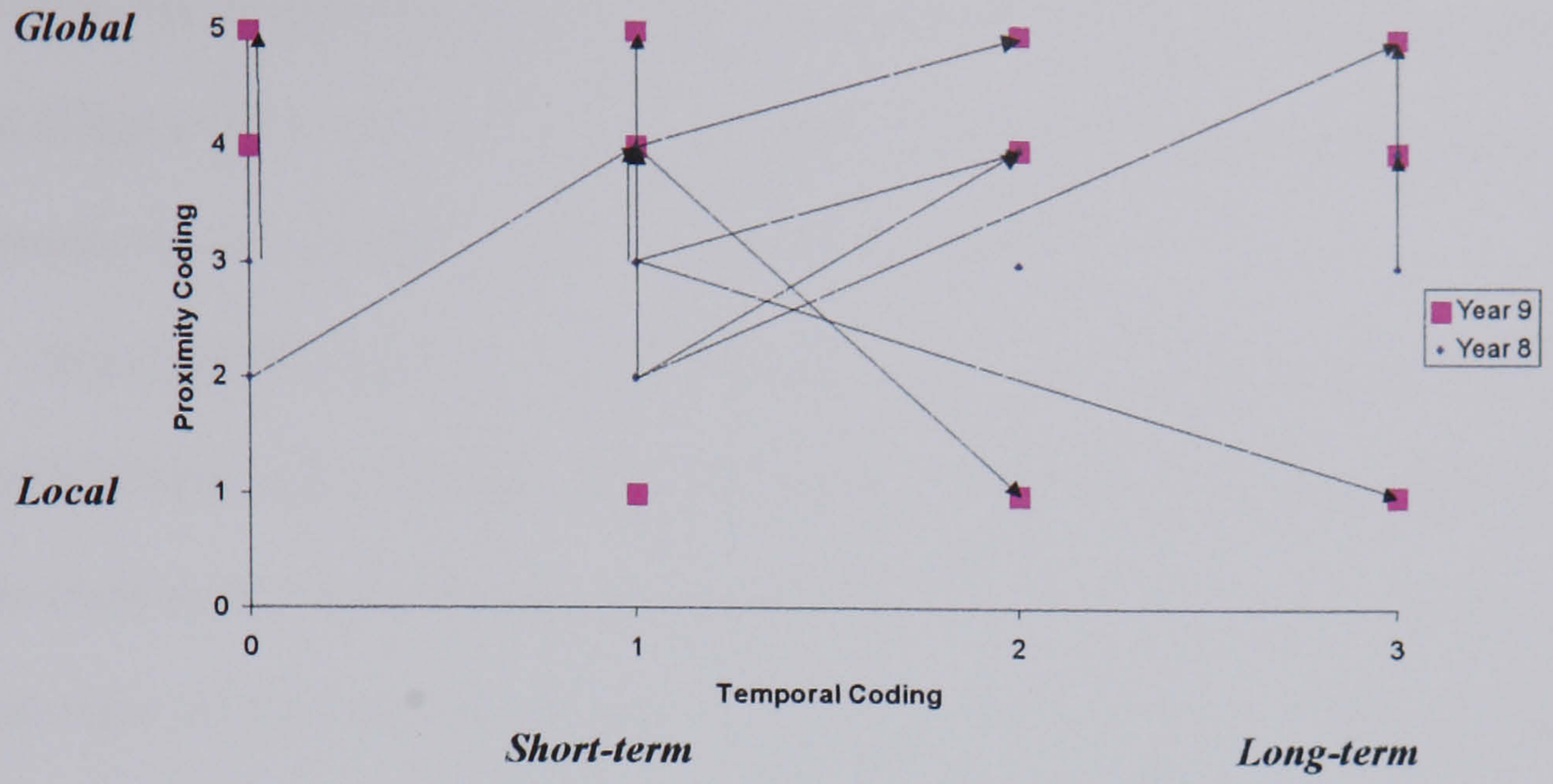
b)



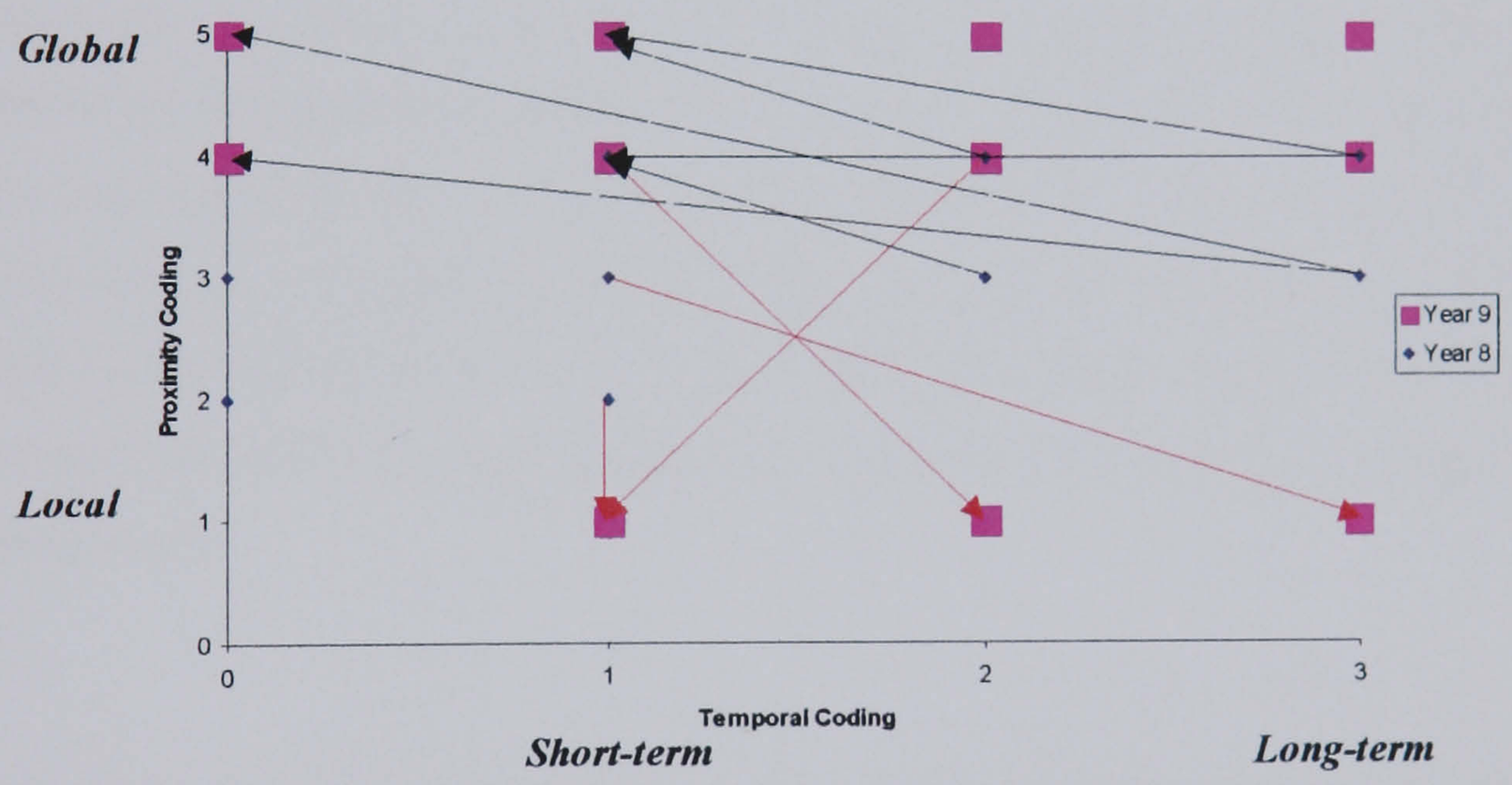
c) Positions of pupil statements-cohort B temporal-proximity coding - Year 8 to Year 9



d) Positive migration of cohort B temporal-proximity placement from Year 8 to Year 9



e) Negative migration statements-cohort B temporal-proximity coding - Year 8 to Year 9



By **Year 9** (Figure 14b) pupils' responses were beginning to separate out on coding to *local* or *global* and less so at the intermediate proximity codes; 85% wrote responses that were emphasizing *national/global* or purely *global* environmental issues (proximity values *4* or *5*). This is a much greater upper proximity coding by cohort B, compared to cohort A (where these proximity values were given to 52% of the Year 9 group).

Positive migration of responses occurred with 62% of cohort B pupils (in Year 8), *away* from the lower temporal-proximity loci upwards, or right, towards the higher coding values (Figure 14d). *Negative migration* occurred with 35% of pupils' responses; for all but four pupils this was primarily a shift in proximity placement.

Four pupils *migrated* to the *lowest* proximity locus, going from Year 8 to Year 9. They had each written very personalized statements demonstrating a strong personal involvement in the environmental issues they commented on. They referred to themselves personally, using 'I', and relating the concern in a sense that suggested close temporal and spatial relation. Alison, who was later to attend BioSoc and become one of the secondary key informants, wrote the following extract:

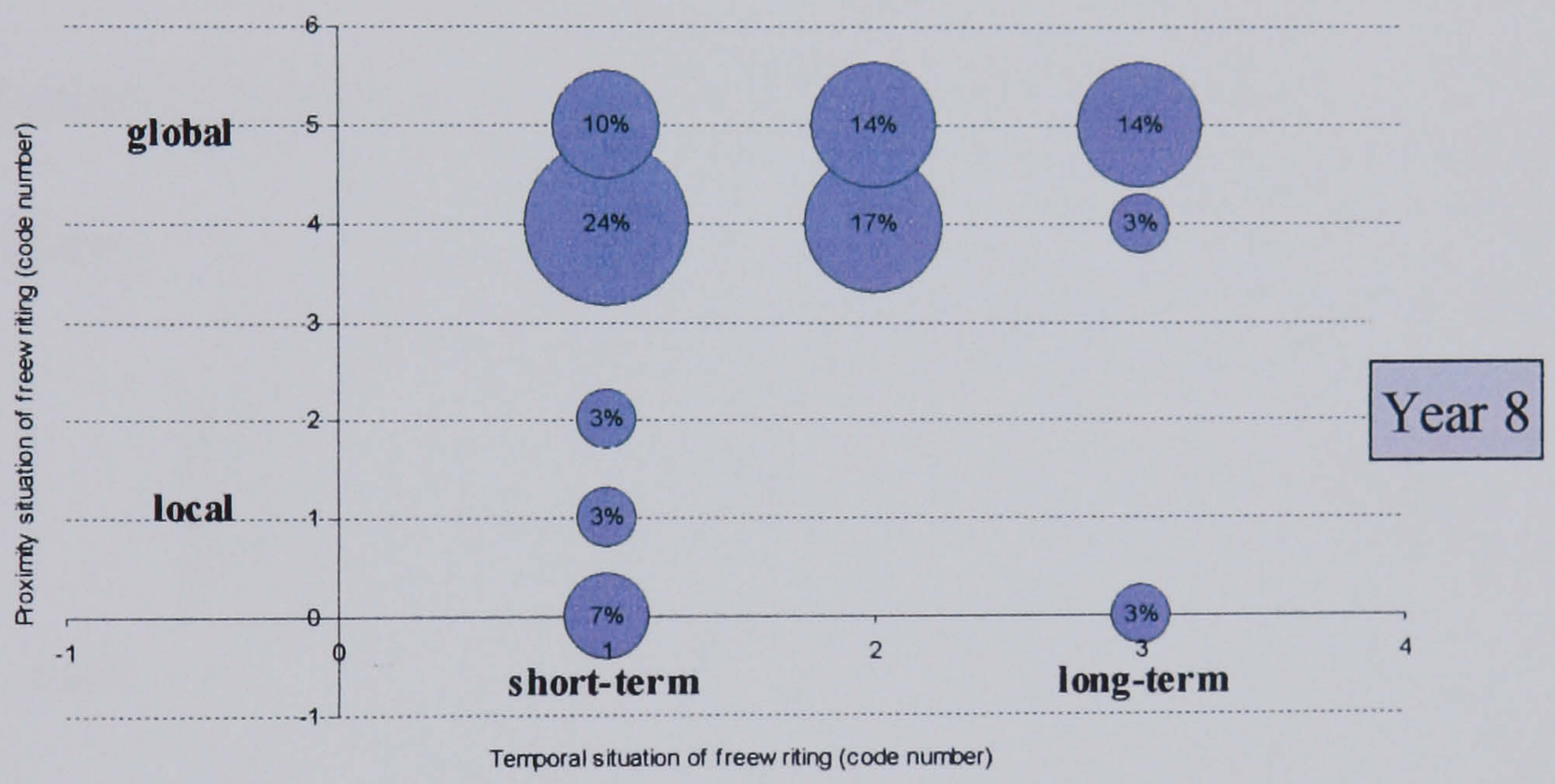
Pollution is a very important issue to me. When I was at the beach this summer I threw all my litter in the bins provided while a family next to me dropped all the litter onto the sand. I though that was disgusting and reported it to the lifeguards. Seatown is such as clean area to live in but tourists don't understand that they should respect our environment. Also deforestation is quite an important issue to me. I did a geography project on the Amazon Rainforest and realised how serious the situation is getting. There needs to be a global group to solve the problem.
(Pupil 6)

When the movements of **cohort C** pupils are tracked on the temporal-proximity grid, an *unexpected migration* pattern emerges. The loci positioning of cohort C pupils' responses on the grid in **Year 8** (Figure15a) has similarities to cohort A in Year 10 and cohort B in Year 9. Approximately 83% of cohort C, in Year 8, gave responses that were coded with *4* or *5* for proximity locus (*national/global and global*), in comparison to only 33% for cohort A and 38% for cohort B, at the same age.

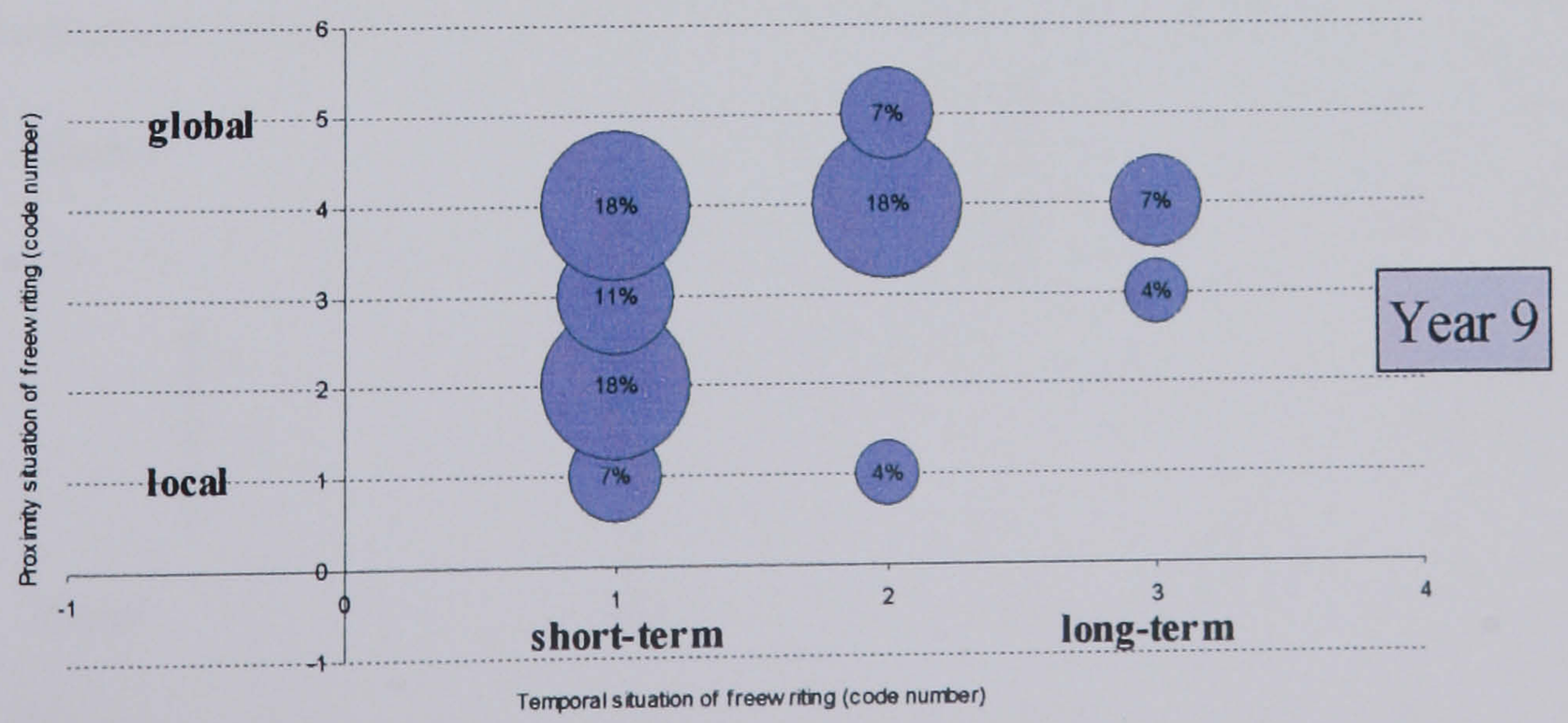
Cohort C, Year 9, coded responses have a distribution on the temporal-proximity grid (Figure15b) that resembles that of cohort A in Year 8. When looking at relative placements of Year 8 and Year 9 statements for cohort C it is not immediately clear (Figure 15c) what changes have taken place.

Figure 15 - Changes in temporal-proximity location of environmental issues concerns for cohort C over their two years of secondary schooling

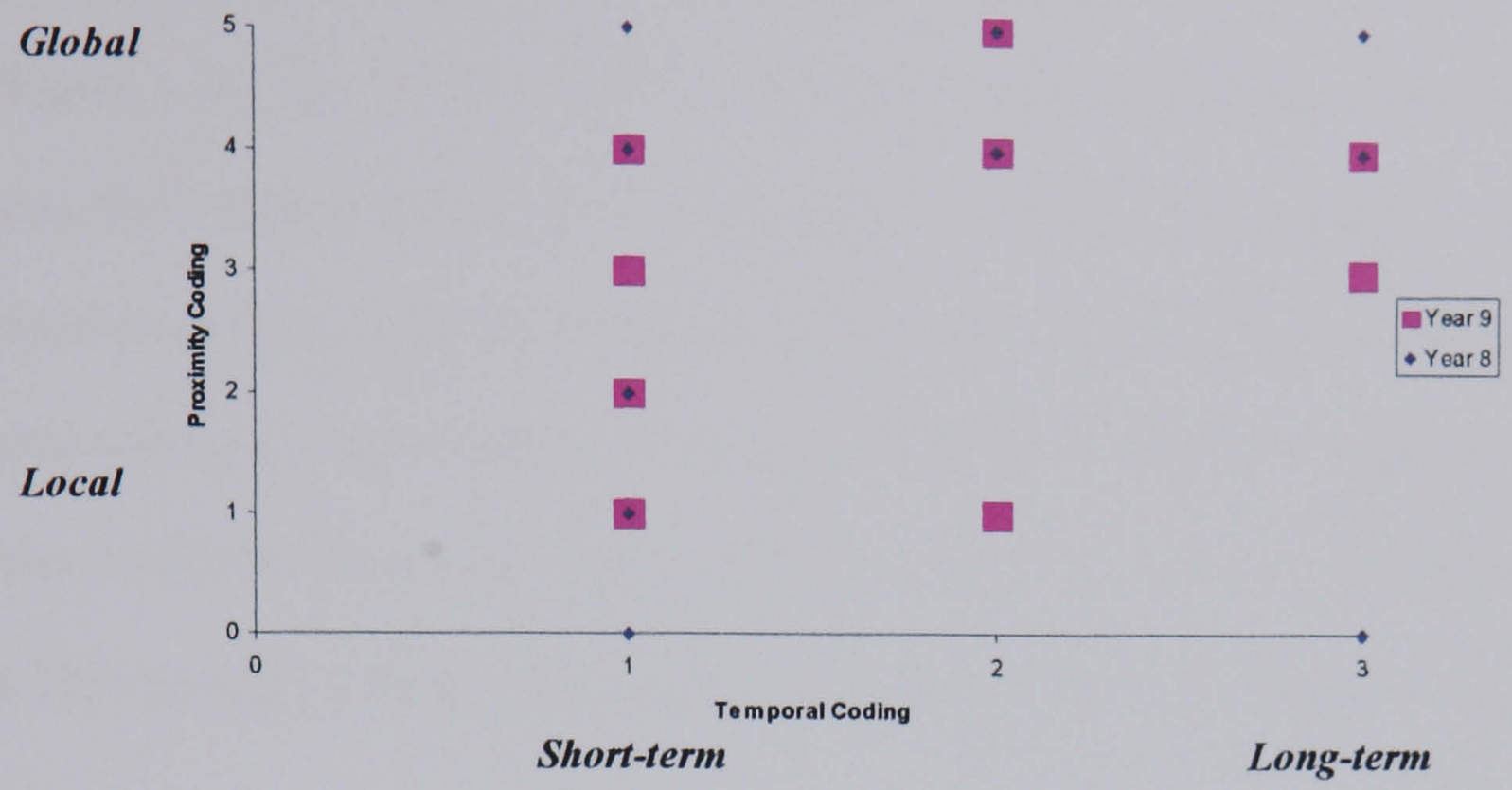
a)



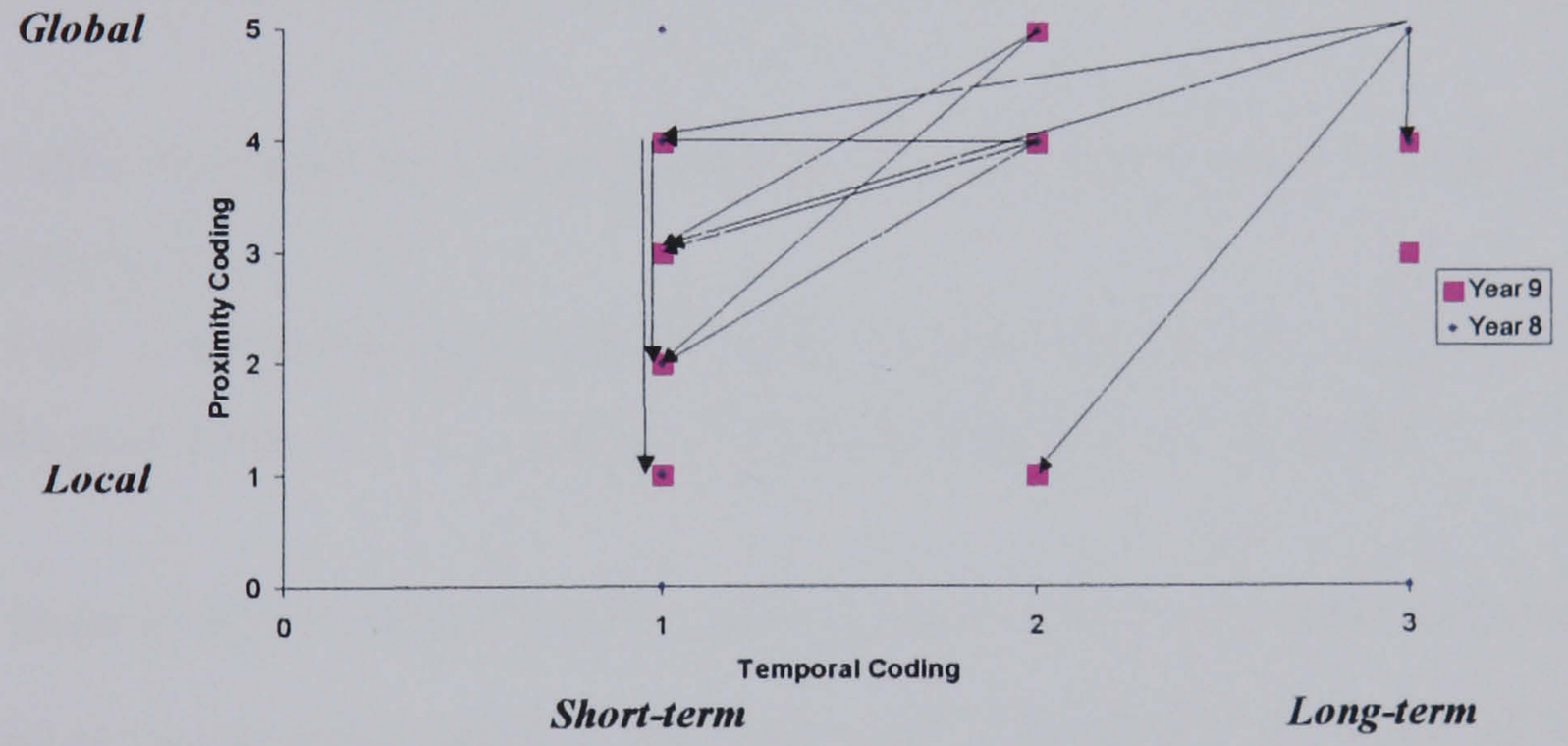
b)



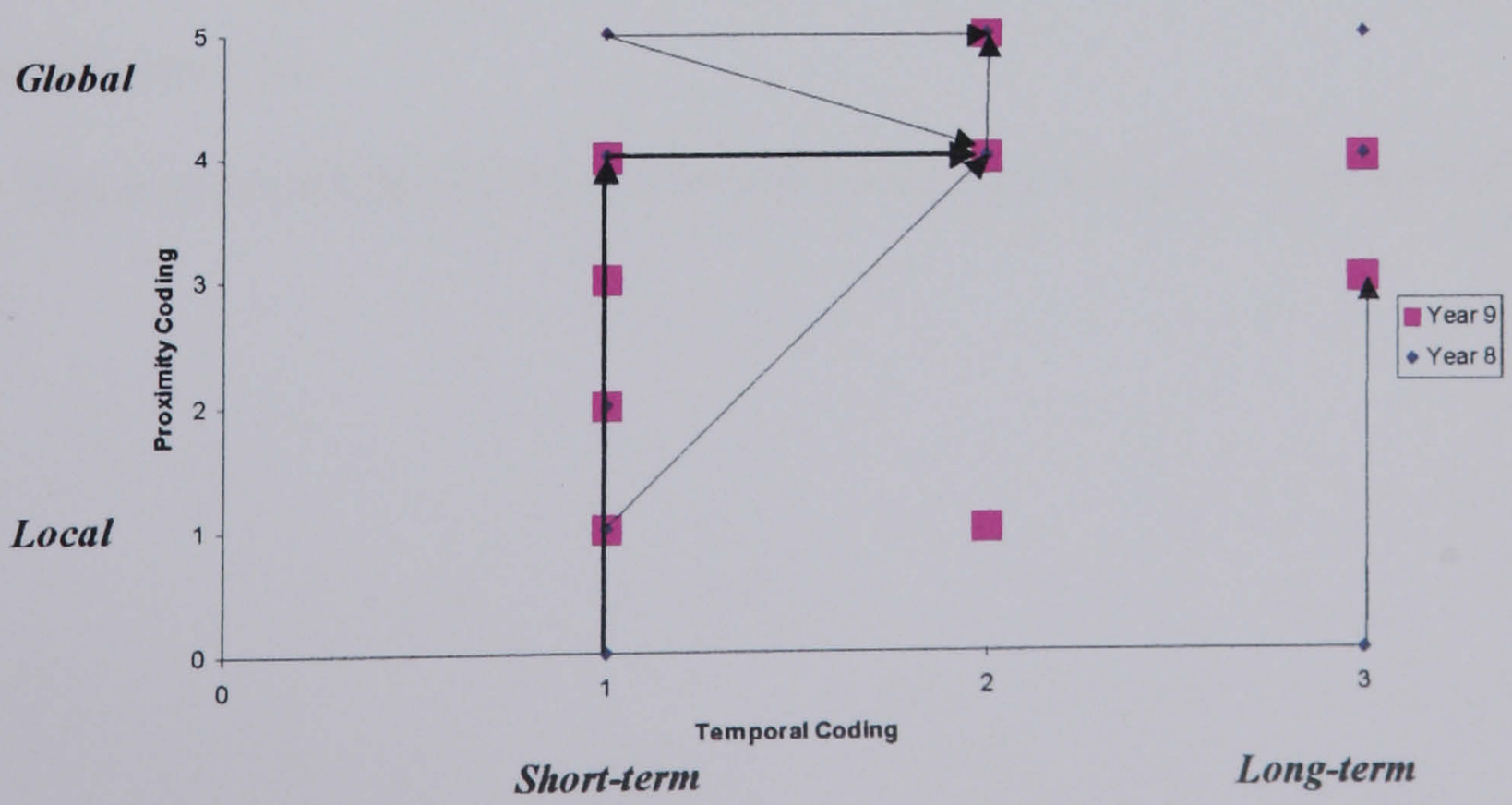
c) Positions of pupil statements-cohort C temporal-proximity coding - Year 8 to Year 9



d) Negative migration statements-cohort C temporal-proximity coding - Year 8 to Year 9



e) Positive migration statements-cohort C temporal-proximity coding - Year 8 to Year 9



Figures 15d and e illustrate the shifting, in statement coding, that has taken place with cohort C. Fifteen percent of the pupils were coded at the same locus they were given the previous year, whilst 50% of the pupil responses *moved back* towards the left had side of the grid (Figure 15d). The increase in the lower proximity proportions had come from pupils changing their written statements from, primarily, *national/global* and *global* issues to those coded as *national* and *local/national* issues. Rather than seeing a decline in the short-term temporal coding of pupils' responses from Year 8 to Year 9, cohort C responses were coded such that a slight *increase* in the *lowest* temporal value – ***1*** – was seen (increase from 48% to 54%). This apparent concern with the more immediate future was evident in the use of terms such as:

It is changing every day ... ...People are ruining other animals... ... ... making things they don't really need... ... ...People are taking advantage.

(Pupil 2)

I am concerned about the way many natural places like woods and heathland are being wiped out... ... ... *(Pupil 5)*

I am concerned about the amount of trees in the world because there are so many being chopped down... ... ...about how many animals are being killed... ... ...

(Pupil 15)

In summary, the majority of the movement in cohort C responses had been *negative migration* across the grid. However, there was some movement of responses *up* from lower temporal-proximity loci to higher ones. These later migrations show slightly wider temporal relevance (Figure 15e).

Figure 16 highlights the main points taken from these migration analyses of all three cohorts.

Figure 16 – Summary of key points from 'environmental concern' migration analyses carried out on freewriting

Over 4 years **cohort A's** written environmental concerns appeared to shift from local/national to more global. The emphasis on more a immediate, short-term time frame was retained into Year 11, but there was a shift away from medium-term (pupils' lifetime) and an increase in long-term, future concerns being expressed.

Cohort B was not dissimilar in its distribution of responses to cohort A, during Year 8. However, the change seen in pupil temporal-proximity loci on the grid in Year 9 is more like that seen for cohort A in Year 11. Four pupils, who wrote of effects on themselves in relation to environmental concerns, made the exception to this overall migration in loci. [These were coded as local for proximity to the pupil]

In their Year 8 responses, a large proportion of **cohort C** wrote about national/global or purely global issues. This is in contrast to cohorts A and B. The greatest migration in response loci was seen in the increase in reference to more local and national environmental issues and retention of a written concern with the more immediate time frame.

4.5 Preliminary Interviews with key informants

Early in the summer term of 2000, informal interviews were held with members of BioSoc. These interviews were primarily designed to explore the dissatisfaction expressed by the pupils with respect to the school club and to use this information to attempt to remedy the situation. In this way, this particular task formed part of the action research aspect of the study (section 4.1.2). The information being gathered was being used to understand the situation more clearly and try to develop changes that might lead to its improvement.

The approach taken to the interviews has elements of both *emotionalism* and *constructionism* (p87, Silverman, 2001). The girls, and indeed myself, are not treated as objects, but 'involved' subjects as a consequence of the relationship and rapport that had developed between both parties. The semi-structured interview style used, bordering on the conversational, allowed a deeper exploration of understandings (in a context suitable for the interviewees) than would have been possible with structured questioning. However, due to the nature of the interviews and the relationships developed with the girls, the responses given were not so much reports as constructions of reality developed, to some degree, in collaboration with the other person involved in the interaction, the interviewer.

This first set of interviews took place towards the end of Year 9 for the BioSoc members (within cohort B). They were soon to sit their Key Stage 3 SATs[15] and this was seen as a good 'pit-stop' to collect thoughts on the, by now waning, participation in BioSoc and the club's future at the school. The semi-structured format of the interview allowed the interviewer to refer to questions as required so that some clear 'answers' regarding the club were gleaned, but also allowing exploration of pupils' thinking, their interests and priorities.

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[15] Standard Assessment Target (National Examination)

As this group had been involved in the freewriting exercise, the interview was also used to link to those questions and to allow the pupils to elaborate if they wished. In each case, the beginning of the interview was an opportunity for the pupil to relax and release some of the built up tension that would inevitably have occurred since being informed of the interview date.

There were 6 pupils interviewed:

✸Susie✸Kath✸Sandra✸Lucy ✸Lily✸Bronwen

These pupils constituted a *purposive sample*, as they had been attending BioSoc meetings and workshops during the course of the year and, in some cases, the previous year. Lucy was a fairly recent addition to the group, present during the bird box construction workshops, held in the technology department of the school. Four of the girls were interviewed, individually, for between 20 and 35 minutes, the exceptions were Bronwen and Lily.

Bronwen was being interviewed on her own in the laboratory when Lily entered and sat down quietly next to her. She had checked if the interview was taking place and then proceeded to join it rather than wait to be interviewed afterwards, as had occurred with the other students in the sample. Rather than cause unnecessary concern to Lily, I refrained from moving her and slowly encouraged her to join in the interview. Lily had demonstrated a greater degree of nervousness about the prospect of the interviews, than the other pupils; however, having Bronwen present at the same time appeared to reduce her anxiety.

Lucy was quite nervous <u>during</u> interview. She did not find it easy to demonstrate her opinions, whether pre-formulated or developed during the interview, consequently, a pattern of short answers emerged in her interview. Lucy gave 42 responses as a direct consequence of questioning by the interviewer; 40% of these responses consisted of one word, 16% of 3 words

(14% being *'I don't know'*) and 14% of more than 10 words (6 sentences varying in length up to 25 words). This was the least productive interview, in relation to exploring the pupils' dissatisfaction with BioSoc. The other pupils were able to elaborate to a greater degree.

Appendix VI presents a summary of the lengths of responses given by the interviewees. These values give an indication of the degree of ease felt by the girls in responding to my questioning. As identified, Lucy was the most ill at ease pupil during these preliminary informal conversations. As she was a relative newcomer to the club meetings, she had had much less contact with me, on a less formal basis. Bronwen gave more responses than the rest as she continued to sit in on Lily's interview (see previous comment). Some interview extracts are used in the body of the text here to illustrate points of analysis.

4.5.1 Some pupil learning preferences

The first question that the pupils were asked required them to begin to explore their feelings towards the sciences in general. The line of questioning was adapted to the responses given by the individual pupils during their interviews. Initially each pupil was reluctant to expand upon apathetic satisfaction with the scientific material they had experienced to date; the most common response being *'It's alright'*.

When Lucy was asked to elaborate on her 'likes' within science she was unable to do so, she was very quick to accept the interpretation offered by the interviewer about her ambivalence towards the subject matter. Lucy did not enjoy attending the case study school. She became slightly more animated during the interview when she was able to legitimately reject school as a path for her future, informing the interviewer she would leave at the end of Yr 11 to go to Art College. It was clear that Lucy had come to some of the BioSoc meetings to spend time with friends when perhaps there was 'nothing better to do' during her lunchtimes.

The sessions she attended involved bird and bat box construction, she had shown some inquisitiveness towards the projects, but on the whole her presence was due to a large proportion of her friendship group (at that time) being involved with the activity.

When probed further about the specifics of their response, the other pupils began to use examples of material that they enjoyed, and that which they disliked, to varying degrees. Sandra identified, quite clearly, that the living world was of more interest to her and within that she particularly liked to experience the animal world. Unlike the other girls interviewed at this stage, Sandra did not express interest in an activity that spanned the sciences; she identified interests that located her very clearly within one of the science categories – the '*live*' life sciences. She was not as drawn to the more abstract subject matter within the sciences. Instead, she indicated that the visual and 'life' contextual ('*...know what you're on about...*') aspect of the life sciences was more stimulating.

Susie, Kath and Bronwen all indicated their enjoyment of *active participation* in their learning. This participation was primarily identified as practical and investigation type activities, which were often, but not exclusively, associated with chemistry. The practical activities and immediate results possible within chemistry, gave the girls the freedom to experiment with their intellectual and manipulative skills, as well as the reactants with which they were provided.

This desire for personal action was reflected in their responses of what they had enjoyed about the BioSoc meetings. In Susie's case, this affinity for development and use of her practical skills overrode her general disaffection for science, her perception of much of Biology being uninteresting and a degree of unease at admitting to attending a school club. This suggests that Susie was able to access and respond to an aspect of EE that was appropriate to her interests and skills. She had not expressed, either verbally or in non-verbal

behaviour, any depth of interest in 'nature', wildlife and the outdoors. She did not have any interest in following up the fate of the bird boxes and the arrival of new avian residents. However, what did attract Susie was the 'hands-on', indoor project of making the bird boxes. Her input into the club was as a direct consequence of her desires to learn and utilize woodworking skills and spend time with her friends. These desires contributed to her evaluation, belief generation and, ultimately to her actions.

All of the girls were expressing their desire for *experiential learning*. They were not satisfied simply to receive knowledge from their teachers; they were aware of the validity of subjectivity and they wanted to be involved in the construction of knowledge (Belenky *et* al, 1997). Kath was clearer about the importance of exploration within investigation work. She was dissatisfied with activities that were presented as experiments but were clearly demonstrations of 'received' theory:

***Kath**: Erm I quite like it but sometimes writing, like, is a bit difficult, but then again that's with every subject, but there's harder words in science like the chemicals and everything, and um I don't mind doing CASE[16] but sometimes if it's like you know when you're doin' an experiment that you've just read in a book, that's gonna happen, then I feel that sort of spoils the experiment a bit because you know what's gonna happen' anyway,*

***Kath**: but if it says there is some but they don't know how much then that sort of makes it better, it seems it's more worthwhile than if you know what's gonna happen.*

***Interviewer**: You don't want to know what the answer's going to be?*

***Kath**: No, 'cause that sort of makes you think, oh why do it then, if you know what the answer is*

[16] Cognitive Acceleration through Science Education (Dept. Education & Professional Studies, Kings College, London)

This removal of the motivational factor, linked to 'questioning', may be a powerful negative influence on action as it affects the belief structure upon which the actions are made. Kath's underlying belief that the experimental outcome is predictable and therefore not worthy of repetition contributes to her frustration at the educator's direction to carry out an incompatible behaviour. Her implication is that she will readily respond with a positive behaviour if she believes that the action is not futile – in the sense of being fruitless, not adding to pre-existing knowledge or understanding, but is simply *'re-inventing the wheel'*.

In addition to Kath's writing problems, Bronwen, found writing caused her difficulties at times, which affected her enjoyment of the lessons. The quantity of written work expected in some science lessons had caused problems for the two girls, as both of them described themselves as 'quite slow writers', and if they tried to increase their speed to accommodate the pace of the lesson, the legibility of their handwriting suffered. This was an issue that was to bear on their future education system choices.

Bronwen also expressed problems with her mathematical skills, which influenced her participation and achievement in Physics. Lily responded in the same way as Bronwen (but had not heard Bronwen's response) towards Physics. The negative attitudes towards writing and mathematics were to be the root cause of a delay in the production of a written summary of a biology project that four of the girls had carried out under the auspices of CREST[17]. It was not completed until their return from summer holidays in 1999 and their entry in to Year 9 (having completed the practical in Year 8 – see section 5.2.3).

Bronwen recalled her interest in investigative science; she owned a small microscope that allowed her to explore the form and function of living things, an activity she had taken part in mostly as a younger child. Her younger brother was now the main user of the microscope, but she was able to recall some samples she still had in tubes. This was

exploratory science without the pressure of consequential assessment of learning. Enjoyment was developed whilst the pupil had been able to express autonomy over the learning process. Bronwen and Lily recalled positive instances of science education in their previous school:

Bronwen: *I remember something I did, like science, when I was really little which was really fun, you got somebody to lie on the floor and you drew around them and you had to put in all their like, all the organs and all the skeleton and everything ((giggles))*

Lily: *That was really cool*

Interviewer: *So do you think science was much more fun when you were at lower school?*

Lily: *Yes*

Bronwen: *Yeh*

Lily: *'cause you got to do like more like experiments*

Bronwen: *'cause we did like a practical almost every lesson in my old school*

This example of the body organs activity illustrates the power of involvement of the entire learner. The movement of an individuals' body from one position to another or simply by animation of limbs has influenced not only the cognitive, but also the affective domains, as the girls recalled how much fun they had whilst carrying out this activity.

So, it appears that, for these pupils, since primary school age, experiential opportunities for the entire learner have declined. This echoed a decline in exploration of the natural world on a more practical level, highlighted by Sandra, when recalling conservation tasks carried out in the school reserve, she confirmed she enjoyed those activities but had not taken part in any for a while. It seems, therefore, that an inconsistency exists between the learning preferences cited by the pupils and the learning experiences they are provided with, this has special significance for EE. It could be suggested that the pupils in this purposive sample are biased towards environmental activities, as they have chosen to attend BioSoc,

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[17] **CRE**ativity in **S**cience and **T**echnology (The BA – British Association for the advancement of science)

however, it became clear from the interviews that not all the pupils held equally strong positive views about aspects of environment. The motivators to more positive environmental behaviour (such as making bird boxes and environmental reserve activities) are specific to the individual. These motivators and personal desires will affect the evaluations made by the pupils and thus the beliefs and actions that follow. The key point is that the approach taken by the educator needs to tap into the values of the individual and, consequently, their desires. A single approach to learning does not support this theory.

4.5.2 Reasons for joining the Biology Society

All the girls, with the exception of Lucy, remarked on enjoyment of practical experience in their learning. Sandra recalled seeing the school reserve area, very early on in her school career, and linking that to practical experience within BioSoc as a reason to join the society in Yr 8. This draw to the 'conservation' area of the case study school was quite strong in Sandra. She had taken part in a number of weekend practical sessions in the school reserve along with Lily, Bronwen and Kath during the previous academic year. However, more recently the society's meetings had remained indoors, in an attempt to accommodate some wishes from the Head of Biology regarding participation in science practical in the laboratory. This had clearly impacted on Sandra, who indicated she had joined the club to spend time in the reserve with the possibility of animal observation.

Kath referred to the positive influence her family of gamekeepers and tree surgeons had had on her interest in the outdoors. Although she denied being a birdwatcher, she went on to describe, with affection, the kind of learning experience she would have with members of her family, using bird identification as an example. She had made reference to Sandra showing an interest in Biology and the club due toher passion for animals. I observed that when Sandra

spoke about animals during Biology lessons, she would often make 'cooing' noises and express quite maternal tones in her remarks. The affinity she felt for animals, and by her own admission, in the main, mammals, was evidence of a 'caring' ethic she held. Two of the girls related more 'human grounded' relationships as important elements within the reasons behind joining the society. In addition, Susie and Lily both referred to 'talking' at lunchtimes, an activity conducted with friends. As the club was held during lunchtimes (a time used by pupils to associate with their friends and talk freely) their participation in the club may well have been influenced by that of their friends.

It appeared that a combination of expectation of practical activities involving exploration of living organisms (primarily animals), and an atmosphere conducive to relationship development played major roles in attracting and retaining these pupils in the club over their Year 8 and halfway into their Year 9.

4.5.3 So what was going wrong?

During the build up to the Easter holidays of 2000, BioSoc had begun to wind down; girls were preparing for SATs examinations in the May and participation in activities had been declining. The decision was made to put the club meetings on hold until after the examination period and the interim was used as an opportunity to carry out these informal interviews. During the interviews pupils were asked to try and summarise why they felt they might not want to return to BioSoc in the summer term. Lucy was a very occasional visitor and so this question was not relevant to her. She simply agreed that she wouldn't choose to go the club in the future. She had found it difficult to express herself during the interview, but she did agree that that she may have been coaxed along by girls who already attended. She was present during the meetings when the club members were constructing bird and bat boxes, a time

when I observed classmates 'popping in and out' of the technology room to find out what was occurring. These classmates were part of the extended friendship group to which I had associated the BioSoc members.

Bronwen had not enjoyed the latter aspects of a Biology award that she, Lily, Sandra and Kath had participated in during Yr 8. The CREST award required written evidence of the practical they had carried out and the style called for was that akin to a scientific write-up within the Sc1 NC guidelines. This was to prove de-motivating for the pupils at the end of an enjoyable period of freshwater invertebrate sampling, and resulted in Bronwen declaring that she was incapable of producing good written work. This was clearly not the case, as Bronwen did contribute to the written piece which helped them to achieve the award. A diary entry recorded that a meeting had been held April 27th 1999 with the girls in relation to their award, and that they had been very keen, during a discussion, to finish their project before the summer so they could start their silver award in the September. However, it had taken a considerable amount of encouragement from myself, to extract the write-up from the girls (by the October of 1999) so they could be awarded their certificates. Although Bronwen did not enjoy this written task, she was delighted to have the certificate to display in her record of achievement portfolio.

Since the dissolution of BioSoc, prior to the SATs examinations, Bronwen had been encouraged to take part in more physical activity outside of curriculum time and she referred to this when asked about returning to the club after the examinations were over. Even when presented with opportunities to accommodate both sport and BioSoc she was less than enthusiastic.

Sandra had seen me, privately, two weeks prior to the interviews to talk about not returning to the club after the examinations, as she felt her friendship groups had changed

sufficiently to affect her enjoyment of the meetings. Although she continued to have an interest in the activities of the club, she was not intending to return in the summer term. Sandra wanted to spend time with her changed circle of friends, and although she verbally expressed an interest in the activities that were to continue with the reserve, it was clear from her tone in the interview that she knew she was highly unlikely to return with or without her new friends.

Susie had expressed an interest in the woodwork aspect of a particular project and once that was over she lost enthusiasm in attending further meetings (see section 4.2.1). She replied with an emphatic 'No' to the question of returning post-examination period.

Kath was the most positive and relaxed of all the girls in the interviews, in relation to potential changes to the club and returning to it after the examinations. She discussed a number of options for change with me but concluded that it was too much for her to take on individually; she wanted the support of her friends.

It appeared that the importance of relationships in influencing the pupils' attendance at club meetings was now acting in a negative way. Sandra had highlighted changes in the dynamics of her friendships, and it seemed now that these were impacting on her involvement in the club. It appeared that the changes taking place had, in fact, impacted on a number of other girls in the club, but they were not willing to discuss details with me.

A diary record shows that the excitement the four girls had experienced upon receiving their CREST award was shared with their friends, as on June 22nd 1999 Alison appeared during a meeting with them in Year 8, she expressed interest in joining the club in Year 9 because of the things her friends had said about their project. However, as recorded in a diary entry dated 9th Sept 1999, Alison came to speak to me regarding a change in her plans to joining BioSoc, as she was no longer friendly with the same group of girls. The problems

faced by the Biology Society were not unique to it; the foreign languages club was having similar participation problems[18].

I identified a number of ways in which the societies meetings dates, organization and activities could be changed to accommodate their concerns. When exploring the possibility of reducing the frequency of meetings and laying out a timetable well in advance, positive feedback was received from Bronwen, Kath and Sandra. However, Lucy and Susie had made it very clear in their interviews that they would not be returning to the society, irrespective of any changes. Three of the girls were asked about changes that could be made to allow them more autonomy with respect to the activity decision-making and organization of BioSoc. However, Bronwen, Kath and Sandra were quite cautious about the idea of taking more responsibility for the general running of the club. They were wary of too much autonomy, concerned that they would not have the imagination to identify activities for club members to participate in, or the management skills to run the club meetings. Bronwen was anxious a large portion of the responsibility being left to her and Lily, as, in her experience, this was a frequent occurrence when they were involved in projects.

Supporting their earlier remarks relating to enjoyment of experiential learning, during the interviews with Sandra and Bronwen, I reminded them of the idea of a camp-over in the school grounds for a weekend at the end of the 1999 summer term. Both students were very enthusiastic, Sandra commented that she had been looking forward to it as a possibility since it was first discussed.

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[18] pers.comm..with Head Girl at case study school

Summarising the main points raised by the pupils, those of:

- pressures on lunchtimes to carry out a variety of activities,
- desires to be with friends in less formal situations,
- enjoyment of practical activities and a degree of autonomy

changes to the running of the club were made (section 4.6).

4.5.4 Initial indications of environmental attitudes

The second half of the interviews were directed more towards probing for aspects of the individual that contribute to overall 'environmental attitude[19]'. Questioning did not necessarily follow exactly the same format in each interview, as flexibility was built in to accommodate the responses provided by the students.

Susie indicated that she was not aware of, and was not considering joining, any environmental or conservation type societies outside of school. However, she did stress that she was worried about some environmental issues. When pressed about her depth of concern, she responded by explaining that, as an individual, she did not have much faith in her effectiveness. She further supported this indication of disempowerment and external locus of control by stating that, even in a group of friends, the numbers would still be too small to effect any change and that age would also count against herself and her peers. This ineffectiveness of the few was commented on by Lucy after stating she would not be carrying out recycling or other such activities once a householder herself. Susie was keen to stress that any difficulties that she predicted were not with people she knew but with people she was not acquainted with and whom she would probably have to approach when dealing with a much

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[19] a multi-faceted concept that can be located on a continuum of values from positive to negative

larger scale dilemma than those tackled on a daily basis. She demonstrated an air of resignation to this perception of external locus of control, with adults taking responsibility for major decision-making. Susie appeared anxious to portray a caring impression of her 'self' with respect to environmental issues, it mattered to her the image I was constructing in my interpretation of her verbal expression of concern. However, she was clear that her current concerns were not deep enough to urge her into action. She demonstrated nervousness when asked about expressing her concerns, verbally, in front of other people, perhaps speaking up within a small group of adults or even her peers.

Kath had been positive about some of the potential changes to the society meetings, she had suggested changing the venue to the school reserve. When the interviewer explored the idea of bird watching or tree identification, for recording purposes, she remarked on her family interest in both those areas. Kath would accompany her uncle and aunty on weekend walks, during which she would be exposed to their interests such as bird watching. When asked if there were any particular environmental concerns she had, Kath referred to her perception of external locus of control and dis-empowerment. She lacked confidence in her communication skills and felt this was a barrier to dialogue with adults. Kath signalled an interest in joining an environmentally related society outside of school, but qualified her inaction by detailing the diminution of her free time after school. Sandra also demonstrated some interest in joining an out of school environmental society, but only if a friend went along with her to participate. She agreed that encouragement by an adult to take part in such an activity was more likely to be successful than if she was left to her own devices.

Bird watching was an activity also taken up by Bronwen's family. Whilst Lily declared her inability to name birds, Bronwen was proud to inform us both of her ability to name birds that visited the neighbour's garden in the mornings. Lily recalled a variety of materials that her

family recycled, she acknowledged that the primary motivation to do this was that there was recycling depot just behind the family home. Bronwen excused her immediate family from recycling as the council had failed in their responsibility to collect materials for recycling from the kerbside. She recalled that the lack of council participation led to the same action being taken by the majority of her neighbours. Almost in compensation, she informed me that her grandmother had recycle bins and a compost heap. When pressed further about any recycling that her family might do, she conceded that occasionally, if the family had a large number of bottles at home, they may make a trip to the bottle bank. Lily re-confirmed that in order for her family to take part in a recycling activity it would have to be perceived by them as 'easy', they were unlikely to carry out any environmental behaviour that appeared to require 'effort'. Bronwen employed this property in emphasising the exertion required for her family to concur with socially acceptable environmental behaviour. However, in both cases the girls agreed that it was not an activity about which they felt strongly. When questioned further about why this was the case, they responded with acknowledgement of awareness of recycling as an issue, but they began to express a lack of engagement of the affective with them.

These two students recalled how EE was approached in their previous school. Key features in their memory included making posters; this seemed to be recalled in an almost oppressive manner. It seemed this was done during geography lessons and that the teaching that took place did increase their knowledge of environmental issues, with the girls acknowledging that they had become more informed due to the exercise that had taken place. However, they both felt that the teaching method used had done nothing for their 'care' about these issues. Bronwen and Lily referred to the information they received, from media sources as well as from school, as repetitive and that it did nothing to change their feelings.

When these two girls were asked whether they felt passionately about anything, Lily quickly responded with '*Football*'. She, openly, informed me that it was because of the players involved in the game. This led me on to ask about the power of personalities in publicizing products or activities. Lily was very animated and in strong agreement with the effect personalities had on her actions. Conversely, Bronwen felt that she would not act in a particular way simply on the evidence of personality involvement. Bronwen described taking part in listening and playing music because she enjoyed it. For Bronwen, it was something that enabled her to include her father, with whom she had a good relationship.

Picking up on the link, they were intimating, between emotional involvement and active participation, I questioned whether this might be true for environmental issues, Bronwen responded:

***Bronwen**: We know they're happening it's just 'cos you can't like really see it happening, it doesn't really like, you don't pay attention to it.*

The girls did not agree with me that breaking the large-scale environmental issue into it's contributing factors would change their position. Whilst Bronwen suggested that setting up the large phenomenon on a small scale in such a way that processes and effects could be 'seen', might be more successful in changing their position, Lily was firm in her declaration that '*...be*[ing] *involved...*' in an emotional sense was critical. When I related this to the pond clearing work the two had been involved in over the two years, they explained that this aspect was lost on them due to the very nature of 'conservation'. Everything seemed to stay the same, they were unaware of any changes and this did not retain their interest. They understood in retrospect, that their actions helped to maintain high invertebrate biodiversity but they recalled that, back in Year 8, they thought they were '*...just dipping...*'. Both girls suggested that more

could be done at the primary school level to encourage pupils to see environmentally responsible action as more like second nature, *'...you're like into it...'*, but they were cautious about the intensity and interpretation of environmentally responsible action. They explained, using examples from other parts of curriculum, that teacher's could fall into the trap of 'overkill' of an activity, which then impacted negatively on the pupils in the future. They suggested converting the last two periods of the day to practical activities; due to decrease in cognitive functioning and general enjoyment of practical tasks, they believed that pupil participation and achievement would improve.

Lily clearly identified emotional involvement as a key feature in EE, her description of hating or not caring for teams other than your own, could be transposed into ambivalence about environmental issues. If one does not have emotional investment in an issue then the response might be to 'switch off'.

Figure 17 summarises the key influences, which have emerged as a consequence of these preliminary interviews, on environmental 'attitude' of these Year 9 pupils. The term 'attitude' in this sense is referring to the degree of *positiveness* or *negativeness* that a pupil 'feels' in relation to environmental behaviour (evaluative).

Figure 17 – Key influences on environmental 'attitude' as identified by the primary purposive sample in the case study school

- Personal effectiveness
- Locus of control
- Degree of engagement of the affective domain
- Confidence in communication skills in relation to dialogue with adults
- Adult encouragement of pupils
- Peer participation
- Time for participation
- Convenience
- Degree of repetition in knowledge provision
- Relevance to pupil

4.6 The changes and the responses

BioSoc was started up again after the SATs were completed. Four key members from the previous sample group (Bronwen, Kath, Lily and Sandra) returned with two new members, Alison and Bev who had both shown interest during the bird and bat boxes construction activity. In addition to this a Year 10 student took up the position of main organizer of the club (Kristen). Lucy and Susie did not return.

A timetable was drawn up in conjunction with the pupils and the dates settled on fell every third week, with the intention that long term projects would have sufficient time to run before checking again and that students could alternate between clubs that fell on the same day. The four key members took part in a WWF on-line debate, posting environmentally related questions to professionals, for their response. A number of responses were posted, however, pupil interest faded, as there was still not opportunity to follow through with active participation. A camp-over was held in the school grounds one weekend in July 2000. All four key members and Kristen took part. The girls were split between two tents with two staff (including myself) in another two tents. The pupils spent the evening looking for evidence of nocturnal mammals in the reserve area and finished with ghost stories around their camping stoves. It was evident that they had enjoyed themselves; they excitedly asked for another to take place the following year. It seemed that BioSoc was to be successful

However, in the autumn term of 2000 (Kristen was now Year 11 and the other members were in Year 10) attendance to the meetings began to decline. Relationship dynamics were changing and influencing pupil decisions regarding club participation. I decided to step back and encourage more control by the key members; however, Kristen reported that attendance by the Year 10's was wavering and that Year 8 attendance was minimal by the end of the term.

4.7 Continuing the questioning

During the preliminary stages the evidence collected was to help determine what was happening with BioSoc, such that reflection by its members might identify ways in which the club needed to change. In addition to this, free-writing evidence was collected to try and begin to understand how pupils conceptualised 'environment', what environmental issues were of most concern to them and how both of these changed as they progressed through school.

Changes were taking place in the club, to try and act on the evaluations made during pupil interviews. Moving into what, traditionally, would be called *the main study* it was decided to maintain the researcher-interviewee relationship such that these girls would be retained as *key informants* (being better placed as part of the pupil community to provide insights into their ways of thinking). Chapter 5 (section 5.2.1) describes how an older member of the club provided a fundamental, detailed reflection on pupil behaviour and action. Due to the difference in researcher-interviewee relationship held with this older pupil, she has been referred to as a *primary key informant* (5.2.2) whilst the younger interviewees have been identified as *secondary key informants*.

Confirmation of the perception of a purely qualitative study, in some academic circles[20], secured the decision to include a quantitative aspect to the main study that might proffer an indication of the generalizability of the interview data amongst pupils in the case study school. In addition to the interviews, a longitudinal paper and pen exercise (a questionnaire) was formulated using the data from the preliminary study, which could be used with whole year groups to indicate the validity of the proposal that environmental 'attitude' decreases as pupils progress through school. It was hoped that the combination of both groups of evidence might begin to unravel factors influencing the dilemma of EE.

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[20] pers.comm. M.Hammersley 10/07/00 (transfer viva voce)

5 'Main' Study and Review of Research Approach

5.1 A non-linear approach

Whilst advantages and disadvantages of a case study, action research-like approach have been discussed in Chapter 2 (section 4.1), it is argued here that such a small scale practice-driven study is not lacking in rigour. Generalizability is affected by the nature of the investigation; however the 'illuminative' effect of such a study has much to offer education research and practice. This approach is in contrast to more positivist approaches to education research; this study is aimed at tackling a 'real' problem by an educator 'at the coal face' of secondary school education (Denscombe, 1998). This research was carried out during the school day, during lunchtimes, tutor times and free periods (interviews with staff). My full time responsibilities (a practitioner at the case study school) provided constraints on the investigation process and indeed, I did face an increased level of work during this period. As one of a number of teachers at the school, I cannot be totally impartial and detached from the study. That is to be seen as a strength, in so far as investigating the provision of a values education in a social environment. A traditional scientific approach to this study would not be appropriate. Humans as free and subjective agents are the focus of this study. An investigation that treated the pupils as objective beings that responded to 'intervention' education in a purely behaviourist model would not reveal the richness of data that emerges from the more ethnographic, case study. This research did not have two clearly defined phases, as one would expect with a traditional scientific study; the preliminary work fed into, but also, ran alongside further quantitative work:

> *'However questionable are the assumptions behind some quantitative research, it tends to deliver apparently reliable and valid correlations between 'variables' that appear to be self-evident.'* (p18, Silverman, 2001)

This advantage of quantitative methods in relation to validity is a reason for following some initial qualitative work with some quantitative data collection. The qualitative evidence informed this further section of the research so that a larger scale of data collection could take place in a suitable time frame and with the minimum of logistical interruption at the case study school. In my opinion, this is not bowing to the 'superiority of positivism' as is the criticism made of quantitative research methods by some 'qualitative purists' (Silverman, 2001), but it is accepting the benefits of the use of different methods at appropriate points in a study (Hillcoat and Forge, 1995). The whole study followed a qualitative process in that it's characteristics, rather than being linear, were more cyclical in nature (Seidel, 1998):

- Iterative (e.g. thinking about the progressive change in environmental concern, noticing link to issue size, collect data on this, think, notice link to feeling, collect data on this, think, etc)
- Recursive (e.g. the act of coding and sorting freewriting fed back on itself. Coding and sorting of freewriting using issues identified in the pupils' statements fed into the temporal-proximity coding and further sorting)
- Holographic (e.g. when first thinking about the progressive change in environmental concern, I was already attempting to make sense of preliminary patterns in my observations)

5.1.1 The longitudinal timetable

Two aspects of the 'main' study were completed over a period of three years 2001-2003. During 2003 I was granted unpaid study-leave from the school. Qualitative data collection was continued, in order to further explore the avenue of rich understanding of the situation occurring at the case study school. The small group of BioSoc members

(*secondary key informants,* section 4.7) were re-interviewed, individually, early in Year 10, six months after their original interviews took place, and after a long summer holiday. These girls were interviewed again in March of 2002, during Year 11, a few months before going on study leave for their G.C.S.E. examinations. The timetable of a variety of evidence collection activities can be seen in table 10; this table highlights the relative temporal placement of the key informant interviews. In addition to this, a further, purposive, sample of pupils was interviewed in relation to EE activities that had taken place at the school; selection was based on the identification of pupils as known participants in EE activities. I used informal information from staff and pupils, alike, to identify these individuals.

Quantitative data was collected over the same period of time. The questionnaire, that provided this data, was designed using the qualitative information collected within the preliminary study (section 4.2). Table 11 identifies the year groups that were provided with the questionnaire to complete. Cohort A pupils belonged to Year 12 at the time of instigation of the questionnaire. The migration patterns of students at the post-16 level put the use of such a questionnaire and meaningful interpretation beyond the scope of this research project.

The whole study incorporated a mixture of longitudinal and cohort-type data collection. The across-age material explores the degree of coherence across individuals **within** one age group and allows successive year groups to be compared for coherence **at** that particular year group. From this, broad trends in environmental '*attitude*' of individuals can be identified (see section 4.5.4).

The longitudinal aspect of the study allows construction of a '*... narrative history of children's changing ideas...*' (p8, Peterson and Tytler, 2001) using more detailed evidence that indicates the complexity of attitude development. Peterson and Tytler (2001) consider that knowing the children involved in their study was a 'methodological advantage'; this

advantage is being used in this study to explore the interrelations between developing attitudes, cognitive changes and personal factors.

Table 10 – Longitudinal timetable of evidence collection

Academic Year	Autumn term	Spring term	Summer term
1997-98	• Freewriting tasks started – cohort A	• Review of statements made by cohort A	
1998-99	• Freewriting cohort A and B • Environment test (Cognitive) with cohorts A and B	• Interview with Head teacher • Interview with Head of Year 9	• Interview with EE Coordinator
1999-2000	• Trial questionnaire with Year 11 • Freewriting with cohorts A, B and C • Environment test with cohort A and B	• Environment PSHE Draft 1 Questionnaire to cohort C[22]	• *Interviews with Year 9 key informants*[21] • Camp-over in school grounds
2000-01	• Questionnaire to Year 8 • Freewriting with cohorts A and C • *Interviews with Year 10 key informants*[21] • *Interview with primary key informant (Yr 11)*[21]	• Environment PSHE Draft 2 Questionnaire to Year 8[22]	• 4 x Year 11 interviews • Teacher Questionnaires • Year 8 definitions task (paper and pen)
2001-2	• Questionnaires to Years 11,9 and 8 • Informal chat with EE coordinator	• *Interviews with Year 11 key informants*[21] • Interview with ITT pupil	• Interviews with Year 10 EE PSHE • Interviews with Year 8 EE PSHE • 3 x Year 11 interviews
2002-3	• Interviews with Year 9 EE PSHE • Questionnaires to Years 11, 10, 9 and 8 • Interview with Head teacher		

[21] *Pupils who participated in BioSoc*

[22] Environment PSHE design completely change in 2001/2 and so questionnaire became defunct

Table 11 – Year groups completing questionnaire

	Pupil groups taking questionnaire/Age of group				
Academic Year:	Group 1 (contains cohort B)	Group 2 (contains cohort C)	Group 3	Group 4	Group 5
2000 - 2001	NQ	NQ	✓ Year 8	Pre-school	Pre-school
2001 - 2002	✓ Year 11	NQ	✓ Year 9	✓ Year 8	Pre-school
2002 - 2003	16+	✓ Year 11	✓ Year 10	✓ Year 9	✓ Year 8

NQ – No questionnaire; Pre-school – pupils had not yet arrived at case study school

5.1.2 Problems with data collection

Having trialled the questionnaire with two Year 11 classes very early on in 2001, the modified questionnaire was used on a whole Year 8 group later in 2001, the youngest year group in the case study school. A second school was involved in questionnaire completion in the summer of 2001 (see section 5.6). The data sets were scanned for potential areas of difficulty and then typed into a database (SPSSv10, 1999) for crude, preliminary analysis. The next opportunity to set the questionnaires was 2002. The issue of logistics indicated that there would be a limit on the number of year groups that could be expected to take part in the questionnaire in any one academic year. The problems encountered were characterised by:

- The author/researcher being a full time pastoral and academic teacher with extra-curricular responsibilities, in addition to organising the production, reprographics, delivery and collection of questionnaires
- The events taking place in the year group throughout the year, influencing tutor cooperation and whole class participation

Indeed, the following year, 2002, three whole year groups were asked to complete the questionnaire; Year 11 - it was decided to use the year group that incorporated Cohort B, as they were in the final year of main school, Year 9 and Year 8 to try to gather information from the younger members of the school (this proved very time-consuming for

the very reasons stated above). In 2003, three whole year groups were given the questionnaire (Years 8, 9, 10), then, once they were completed and collected in, a 4th year group (Year 11) was approached. The author was able to follow up this 4th set due to being on unpaid leave and thus having more flexibility. A number of 'gentle' reminders, re-photocopied questionnaires and trips into the school were, finally, fruitful.

The task of carrying out a 10-minute questionnaire seemed reasonable, however, when placed in the context of the school day it can become highly unlikely. To confirm what was perceived, by myself, as a high degree of cooperation by the teachers in the case study school attempts were made to have questionnaires completed by comparable schools. '*Comparable*' in this initial instance was being used in the sense of:

- All girls Grammar school (selective)
- Entrance tested
- Number of pupils on role
- Number of teaching staff
- Position in league tables

There were differences in the SEN and numbers of pupils eligible for free school meals (BBC, 2003; OFSTED, 2003). The values for these factors will have varied slightly over the course of the research, but they could be used to indicate a degree of compatibility. One of the comparison schools was contacted on four different occasions (telephone, email and twice by letter) without any response. Another school agreed to try and take part; they accepted my personal delivery of the questionnaires for Years 7, 8 and 11. However, after 'gentle' reminders over 2 academic terms, the Head teacher's secretary apologetically informed the me that, *'the prospect of getting* [the] *questionnaires* [done] *was not looking good'*[23]. This contrasts with the high level of cooperation received from the case study school at a time of increasing pressure in secondary education.

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[23] pers.comm. 18/12/02

5.2 The Interviews

5.2.1 'Conditions' of the interviews

The interviews were to be held with pupils who participated in BioSoc for the majority of their Year 9. Most of the original *key informants* sample (section 4.5) was retained with one or two changes of *peripheral* individuals (transient members). This set of interviews began with a *primary key informant* (section 4.7), a Year 11 pupil, who had taken increasing responsibility for the organisation and general running of the society. Aspects of this interview were used to inform the Year 10 interviews that followed during the autumn term of 2000. The primary key informant left school after Year 11 and joined a college in the north of England. The Year 10 sample was re-interviewed during the latter part of their Year 11, early in 2002.

The transcribed interviews were coded (Silverman, 2002) for verbal nuances that would not be evident from the written words alone. This coding was used to aid me in recalling the atmosphere of the interview, however I have excluded them from this report to improve clarity of reading. As all interviewed pupils in the case study were pre-sixth form, they had full timetables that did not provide any 'free-time' other than break times and lunchtimes, consequently, the interviews were held during their lunchtime period. Pupils were given credits (part of the school policy on praise) to thank them for giving up their lunchtimes for interviewing. This was not intended as a motivational influence to turn up to the interview (Sivek, 2002), but was genuinely meant in appreciation of surrendering their 'down-time'.

The interviews were 'semi-structured' such that there was a list of questions identified prior to the interviews to help guide me, however, once the conversation began if the pupil began exploring a side-avenue I 'let it run' until it was clear that a 'dead-end' had been reached (this could be silence or completely non-related information). The setting for the interviews was the same each time; a room that had pupils' work on the walls and a

large 'living' fish tank at one side. The room was chosen due to the security aspect (it was able to be shut off during interviews, unlike some rooms that were 'walk-through') and the fact that it was my primary teaching room, so very few logistical problems were encountered.

Initially, more open-ended, *'warm-up'*, questions were used, asking about 'feelings'; this allowed me to make some initial judgements on the degree of cooperation pupils were likely to provide, before moving onto the body of the interview (Stuhlmiller, 2001). As a female myself, it might be that the pupils would feel more able to share 'gender-sensitive information', such as the increasing relevance of boyfriends, than they would otherwise (Sivek, 2002). I used smiles and laughing as encouragement throughout the interview, the pupils responded well to this and were probably more forthcoming than they would have been in a much drier atmosphere (Denscombe, 1998). Privacy was important to the pupils and it was clear that trust in me was of paramount importance for open and truthful discussion. I assured the girls that only I would be aware of the information they had given, and it was clear that once the first interviews were completed and this was seen to be the case, the next set of interviews were visibly easier for the pupils to take part in.

All interviews were completed in 35 minutes or less. The interviews were audio tape-recorded; all pupils had been offered the right to object. I did not make notes during the interview, it was decided that eye contact with the pupil and an atmosphere conducive to 'conversation' was important; stopping to make notes would have detracted from this. Generally there was time to end the interviews with a version of the question *'Is there anything else you would like to add, or perhaps ask me?'*, this was seen as a way of drawing the interview to a close and a form of further empowerment of the pupil in the spirit of the collaborative interview. In one or two instances the interview came to a natural conclusion and this closure was not used.

5.2.2 Primary Key Informant's narrative – descriptive analysis

In contrast to the initial informal conversations held with the Year 9 BioSoc members in the previous term, Kristen showed herself to be very comfortable in the presence of a tape-recorder and able to express more fluid responses to the questions posed. We had been acquainted for a longer period, having been her tutor for a year (Year 8) and then maintaining contact throughout the next two years at the school. Thus, at the point of interview, Kristen had known me for over three years and this undoubtedly contributed to the trusting and relaxed atmosphere. During the interview Kristen provided 44 responses to questioning, of which only three were one word (*'Yes'*) answers, this constituted less than 7% of her responses (less than half that of the lowest for the Year 9 pupils in the previous term). She found it very easy to develop her responses without provocation, with 36 out of the 44 responses (82%) constructed of more than 30 words that did not include *'I don't know'* or *'erm'* or exact repetitions.

Kristen had begun to get involved in BioSoc during her Year 9, when the main set of key informants were in Year 8 taking part in the CREST award (section 4.5.1). She was an unhappy pupil at this time, with few close friends, making herself 'at the service' of the Biology department during her lunchtimes late in the spring term of 1999. In interview, she recalled helping out in the department during her lunchtime and that this increased her interest in the subject. During the first few sessions she had overheard me talking to the Year 8 group about their bronze CREST award and she expressed an interest in carrying out such a project individually. Kristen was prepared to start her silver award project in the following September, having organised an external mentor and research question. However, she was to have a set back in her feeling of security and possibility for future planning. Kristen was very upset to learn of a potential family move to the Caribbean for a period of one year. She was anxious about the effect this would have on her first year of

G.C.S.E. studies, and that she would not be able to continue with her project, even after all the planning she had completed.

Kristen was able to return to the case study school in the September of the new academic year (2000), and she was thrilled to have confirmation from her parents that she would not have to leave the country during her examination years. A BioSoc meeting was held very early in this new term to discuss the society's programme for the year. Kristen became the primary driving force and the four pupils (now Year 10) who had completed their award agreed to form a committee that would provide pupil led activities for younger pupils. Kristen struggled to achieve involvement of these Year 10 pupils. She successfully persuaded them to take turns in supervising the society stall during the *'freshers' forum'* lunchtime session, two weeks into the term. Kristen's feedback was very positive, there had been much interest in the society and it's activities. She took her position of responsibility very seriously, as a short entry in my researcher-diary recorded:

Sept 2000 *- Kristen is extremely enthusiastic, she has produced badges, membership cards and has got the club a web site, she oozes energy. The year 10 girls are keeping a low profile*

It was at this time that the informal interview was held with Kristen, it was an opportunity to allow Kristen to expand on casual comments made during the beginning of the term. She did not discuss the relationship problems she was experiencing at home and at school, instead she focussed on the academic support she thought participating in BioSoc might provide:

Kristen*: Erm, I thought it would be, erm it would help me a lot more with my studies I thought it would possibly give me a bit more information and it would be something different and possibly fun to do.*

This reference to enjoyment was an echo of part of the reasoning given by the younger pupils in the previous term. The society is held during pupils' own 'downtime' and consequently, personal gratification is of high priority. This is in contrast to lessons, where pupils frequently consider that learning is not compatible with fun and that precedence lies with the former. As year 10 involvement had declined to an insignificant level, Kristen encouraged her new '*close*' friends to join her in organisation of society events. The first few 'strategy' meetings were well attended by entry year pupils (Year 8), numbers varying between 6 and 15. Kristen reflected on the possible perception of the society by pupils who did not attend:

***Kristen**: I think possibly people who don't come think it's more of a like a boff group where people are, who are only smart can come and er, they probably think it is a lot like a biology lesson and they probably think that you, you don't do anything fun or have a laugh or anything, but it's a lot different.*

Kristen confirmed that the name of the society had some influence on the perception of its activities by those that did not attend. The use of the term 'Biology' seemed to immediately connect with images of lessons. She considered the name too formal for a voluntary lunchtime club and suggested the removal of any connection to 'Bio-' in the club name would be necessary to dispel an immediate prejudice. The negative imagery that was described consisted of affiliation with curriculum science and highly intelligent pupils who desired to continue with 'work' outside of normal curriculum time. It appeared that the activities of the club were not suitably transparent to other pupils in school. Kristen suggested that pupil who did have an interest in conservation and environmental matters would not be drawn to a Biology Society as its laboratory based experimental image would not be attractive to that type of individual. In contrast, she had noted that a new 'environmental' club, which had been set up by the school EE coordinator, in collaboration with two or three sixth formers, had attracted much more attention at the freshers' forum.

Kristen identified the reason was that the club was clearly concerned with environmental matters '*...which is a whole different thing to biology, well it seems to be.*'

In congruence with evidence from the previous interviews, Kristen suggested that most of the Year 8 recruits were signing up for the club, as it was new to them. However, she considered the recent thoughts on the production of a newsletter and a web site had projected a more modern image to the pupils in keeping with their rapidly developing computer literacy and use. This move from a less technologically oriented club had changed the degree of appeal evident in the young pupils. Kristen reported that photographs of conservation work in the school reserve had encouraged Year 8, 9, 10 and Year 12 pupils to approach her and ask questions about the club's practical activities. The sixth formers that asked about conservation work immediately withdrew their interest when Kristen explained that it took place at weekends, referring to work load as a prime barrier. Kristen was asked her opinion relating to the lack of interest shown by more senior pupils towards such clubs:

***Kristen**: I suppose because as you go through the school erm, because I know most of my friends do, you er, you start you start to erm, I suppose you start to think that you're too grown up for certain things and you try to fit in with the crowd, and most people probably wouldn't actually want to go to a Biology Society, and so people try to fit in with the crowd so they gradually lose interest, and they gradually start to do what their friends do, I think it is a lot of influence with what their friends think.*

Kristen suggested activities that would be substitutes for participating in a lunchtime club. Although sports clubs were well supported by pupils at the school, value was placed on the empowerment of pupils to choose not to commit to structure during a period of 'free' time. The choice made was 'relationships'; and the attention to 'care'; the older pupils revealed to Kristen a concern over the perception of their selves by others, the others being pupils that mattered to the individuals. Environmental activities, such as forms

of conservation work, supported outside of school, were likely to be viewed as extensions of school, in Kristen's opinion. She felt that '*... most people...* ' (her supporting evidence was being drawn from relationships with her peers) were more preoccupied with activities such as shopping; school was a place of examination preparation whilst the outside world offered other life opportunities.

In addition to the state of friendships, Kristen identified popularity as a significant issue of concern in her age group. She considered some of the positions of responsibility taken up by pupils were clearly done so by *manipulation* of an initially democratic process. Due to the discrimination of minor groups (based on size) in the form, positions of responsibility had fallen to the same group, often the same individual, time after time. This led to the use of a 'first out of the hat' approach (agreed upon by form and tutor). Kristen distinguished between the role of popularity in Year 11 and the friendship 'bring and buy' that existed in Year 8.

She described how, in the youngest age group at the school, unfamiliarity with surroundings, and people, encouraged pupils to communicate with a wide variety of peers in order to search out what constituted their 'self', so contributing to decisions about more long-term associations. Once pupils move from this entry level there is less 'perceived' heterogeneity within the form and individuals begin to distil into categorical arrangements. In terms of visual identification within the classroom she described two main subsets:

- Saturday shoppers – slaves to fashion
- Work ethic oriented

these were linked to characteristic expressions of the groups

- Gregarious, cross class mixing
- Intimate / small friendship groupings

This difference appears to be cemented over the years such that translation from one group to another is not usually met with success. In her opinion, the groups that developed during

Year 8 would not change significantly over the next three years and so affiliation to a group at this time was a long-term commitment.

Kristen reflected upon her decision to join the BioSoc part way through her Year 9, an action that was taken in isolation from her peers at a time when groups were becoming more settled. She admitted to hiding her actions from her peers during Year 9 and 10. Although she had been willing to be photographed by the local newspaper (bird box construction coincided with a national bird week) she recalled her *resignation* to her 'uncloaking' when the newspaper was published and a cutting was displayed in the school. Her stoicism enabled her to continue with the society throughout Year 10 and then into Year 11, when she began to take on more responsibility. She explained that acting and singing lessons had been the linchpin to her improved confidence and greater feeling of self-worth. This affected other aspects of her life, such as continuing to participate in the society, regardless of what her peers may have thought. Kristen described a period of two years during which she was a self-conscious individual, concerned with others' perceptions of herself and consequently unable to unlock and express her 'true' inner self. The expressive arts had been a mechanism by which she had accessed those inner reaches and developed the confidence to present them to the outside world. Her close friends, the people with whom she had important relationships, were the ones that she cared about, the lack of 'care' she felt for people outside of these relationships was expressed in her disregard for their judgements.

Kristen had suffered a period of provocation from some of her peers, in relation to her participation in the club, during Year 9 and 10. This teasing had stopped, something she put down to her persistence to attend, regardless of their negative attention. As popularity had been expressed as an important issue, I questioned the likelihood of this type of stoic reaction in other pupils. Kristen agreed that it was not likely to be a common occurrence in pupils to disregard perceptions developed by peers. Kristen described a

stigma being attached to taking part in an academic subject outside of normal lesson time. She opined it was the social structuring of school and the compulsory nature of education that had generated a negative response to academic pursuits. She supported my observations regarding pupils' behaviour towards school and schoolwork, describing Year 8 as a period of novelty and exploration, characteristics that would fade with increased familiarity. Once in Year 9, pupils could '*... look down over...* ' (Kristen) younger pupils and, consequently, express legitimate authority that had not been possible in their previous year. When pupils moved on into Years 10 and 11, rather than needing to express the value of their position within the school hierarchical system, pupils shifted to a preoccupation with popularity within and beyond the confines of their year group.

Kristen suggested that the potential for club success was much greater than that provided by either the BioSoc or the newly set up Environment Club. She explained that pupils in the case study school were much more likely to attend academic extra-curricular activities than pupils she had remained friends with in non-selective, co-educational schools in the surrounding area. To increase their potential, the clubs would have to re-think their strategies for pupil participation. She was clear that computers were under-valued and under-used and that the 'fun' element was under-played in promotion of the clubs. She emphasised her view that <u>fun</u> was the key in encouraging and maintaining participation by pupils during their school 'free time'.

Kristen described how taking part in BioSoc had encouraged, from within her, the emergence of a genuine interest in life sciences, which she went on to express outside of school; she had taken part in a park regeneration programme near her home. She considered that joining a club at school could well be the catalyst needed to encourage pupils to take more interest in their surroundings and take part in environmental activities after school. Her recollection of EE within school was not as positive. She described the general disaffection that was expressed by pupils when faced with EE lessons, echoing my

own observations, as a teacher. Her explanation for this was quite derisive about the degree of self-centredness displayed by her peers:

***Kristen**: I don't know, erm, I don't, I think, because I don't think they really care what's going on outside them, as long as the little world they live in is okay erm I mean everybody was concerned with the petrol crisis because they couldn't get to (town name) to go shopping and but as long as everything in the world around them is okay then they don't I don't think they really care what else is going on as along as everything that happens to them is okay.*

This description painted a picture of pupils who had not reached very high up the moral development ladder. The outcome was that one appeared to be acting in the interest of others, however the intention was self-serving. Kristen described the 'substance' of the EE lessons as '*... outside of their boundaries...* ', resulting in pupils disconnecting from the experience. The tasks set would be completed, but the pupils, with hearts and minds distracted, would be focussing elsewhere such as on recent television programmes or the previous night's social activities. She felt that until environmental issues were made more personal, pupils would continue to lack engagement with them. For her, personal impact could mean planning issues affecting their school or places of social activity such as the local shopping centre. Only once issues impinged on pupils personally, in their own space and time, would they connect with 'environment'.

Kristen completed the interview by explaining how environmental concern was unlikely to develop in the pupils she spent time with until they had children of their own. She considered this dependence of another human being on oneself to be motivation to take notice of one's environment. In her response she identified dual worlds, one inner and one outer. Pupils were described as disconnected from the outer, wider world, only having concern for the personal inner world. Kristen felt that this would change once the girls became mothers. When I responded to this illustration of insular existence by reference to

verbalised concern from her peers to issues such as pollution and global deforestation, Kristen reasoned that the concern expressed was not necessarily internally generated. She referred to her knowledge of activities of friends and peers, more specifically to the scarcity of interest and attention to media presentations of environmental issues, as a route to understanding where these voices were generated.

Kristen suggested that parents were the main sources of these voices and that pupils had not developed them through reasoning or emotion. Consequently, if such a voice were expressed during a conversation with peers, when an adult was absent from the social milieu of adolescent schoolgirls, the other members of the group would be unable to respond and the issue would not gain 'air time'. Topics of conversation that maintained interest would be ones that individual pupils had experienced, such as a soap-opera from the previous night's television viewing, a topic that pupils could relate to, and discuss with interest and authority. Topics were in direct competition and, Kristen remarked, the response by friends and peers is to *'... shove the environment out of the window'*. Kristen described a situation whereby environmental concerns had not reached the inner world of her peers and as a result, remained no more than transitory flirtations in conversation, which could readily be usurped by more pressing, personal topics. This emphasis youths place on friends and leisure time as *'... the most meaningful part of their lives...'* (p5) is reported in other studies (Schreiner and Sjøberg, 2003).

5.2.3 Secondary Key Informants - Year 10 Response structure

These interviews were informed by the primary key informant interview with Kristen. Key points were taken from Kristen's responses and a semi-structured interview was designed to explore the validity of her comments.

Bev and Alison were new to interview this time around, however, this did not prevent them from providing quite lengthy responses. The proportion of long responses

each of these pupils gave was similar to that of the most talkative pupils in the previous year. Bev gave a greater proportion of single word responses; this was due to her tendency to jump in with the affirmative when the interviewer was in the process of summarising her interpretation of what was being said by the pupil. Kath too frequently interjecting affirmative 'Yes' responses whilst the interviewer would slowly describe interpretations of what was being said. Consequently, there was a degree of repetition where single responses would have sufficed. Both Sandra and Bronwen gave interviews with fewer single responses and a greater proportion of longer responses compared to the previous year.

This shift from shorter to longer, more lengthy, fluid responses may be due to a combination of factors, rather than any single element:

- Pupil-interviewer familiarity – element of trust
- Increasing interviewer restraint in dialogue
- Use of a semi structured approach to questioning compared to the more open casual approach in the Year 9 conversations
- Increase in pupil confidence – basis of anonymity established

5.2.4 Secondary Key Informants - Year 11 response Structure

The same group of secondary key informants were approached in the spring of their final compulsory year of schooling. Lily and Alison were much more comfortable during this interview session. They both tried to provide substance to their responses, which resulted in them taking a more active role in the discourse.

Sandra did not show any significant change in her ease of responses from the Year 10 interviews. The interviewer attempted to clarify her responses more frequently during the interview, Sandra would affirm or refute with few words; consequently, she appeared to provide slightly more shortened answers in this session. Kath demonstrated an increase

in ease with the interviewer. She spoke in a chatty manner, leaning in towards the interviewer and using terms like '... *do you get what I'm saying*... '. Kath's use of personal instances of peer pressure, both her awareness of and implication in, were indicative of her willingness to expose normally private information. The interview with Bronwen involved a more dynamic discourse, where answers and clarifications were quickly passed backwards and forwards, resulting in shorter response lengths.

5.2.5 Analytical method for secondary key informant interviews

The secondary key informants formed a small but purposefully chosen sample. These pupils were in a special position; one of having participated in the school biology club and lost interest, in addition to being adolescent girls within the case study school who had expressed lack of concern over environmental issues.

The analyses of transcribed interview data and the freewriting texts were carried out ideographically; coding categories were derived from pupils' responses. It was deemed inappropriate to distinguish pupil responses as valid and invalid, based on researcher impression, as has been done in other research (Kasapoğlu and Ecevit, 2002). For purposes of analysis, the transcripts of the secondary informants interviews were imported into a qualitative software programme, QSR N6 (QSR, 2002), thorough discussion on its use in research is available elsewhere (Crowley *et al*, 2002). Categories, and sub-categories, were constructed that allowed the convenient coding of response passages from the interviews.

The coding of the interviews is based on content of the responses. In this qualitative method the codes are being used for the purposes of categorisation, from which narrative can be used to explain the dimensions and connections of the categories. The theory developed emerges from the data (a characteristic of grounded theory) as opposed to fitting the data to a predetermined model (Calloway and Knapp, 1995). Content analysis is used to strive to produce '... *replicable and valid inferences from data to their context.*' (p21,

Krippendorff, 1980); that is the analysis is being performed '*... relative to and justified in terms of* ***the context of the data.***' (original emphasis, p23, Krippendorff, 1980). The context of the data is the environment of the data collection; the two individuals involved in the data collection (interviewer and interviewee), their relationship and interaction with each other and the place of the interview.

5.2.6 Reliability and validity of analysis

The category formation followed a more inductive process (Mayring, 2000), whereby the data defined the categories through material review and revision of category formulation. I am in a privileged and important position of being the interviewer of the pupils; consequently I have a deep understanding of the context of the data that is not possible for another researcher to obtain simply by reading the transcripts. A second researcher, with no connection to the study, checked the categories against three transcripts (chosen by random). Following this, both researchers met and collaborated on the justifications for code choice and text interpretations; category definitions and distinctions were refined and redundant categories removed (Appendix VIIa)

Restricting the overall process of codifying the transcripts to a single researcher has retained the reliability of the coding. In all coding there will be an element of subjectivity, however, the variation in this has been limited in this study by coding within the context of the interviews, and by applying a consistent approach to all transcripts.

Year 10 and Year 11 transcripts were coded for categories. The emergence of a particular category in both years indicated a high degree of validity one could place on that category (Appendix VIIb). However, the interviews were semi-structured; consequently, if the interview took a slightly different direction to that in the question 'scaffold', it may be that a pupil did not contribute to a particular category by omission rather than changing view. As the interviews were not designed to be identical, some categories are year

specific. Nevertheless, the interviews have allowed categories to emerge that go some way to describing the dynamics existing within the case study.

Coding identified pupils who repeated an opinion or view from one year to the next. This indicated the degree of validity for the responses given by the pupils in interview, suggesting they were unchanging 'truths' held by the informants (Appendix VIIc). The remarks made about the EE the pupils had participated in at school suggested a high degree of validity as far as the construction of coding categories (Appendix VIIb); however, there was low repeat commenting by pupils. This should not be misinterpreted as suggesting that there is no support for the remarks being more 'deep-seated' than 'anecdotal'. This interviewer stresses the semi-structured nature of the interviews and the issue of omission rather than change in belief.

5.2.7 Coding categories emerging from secondary key informants interviews

The complete list of coding categories consisted of 14 items. This list can be viewed in figure 18. As identified in the previous section, these categories have evolved from the analysis of both Year 10 and Year 11 transcripts.

The first three categories reflected the questions that were asked during the opening of the interviews. This allowed the pupils to reflect on their feelings about their declining participation in BioSoc. It would provide me with an opportunity to, later, cross check these responses with those given by Kristen, the primary key informant.

Figure 18 – Complete list of coding categories for Year 10 and Year 11 key informant interviews

a) Expectations pupils had about the biology club
b) Non participants perceptions of the club (participants' perceptions of)
c) Influences on pupils' interest in a club
d) Lunchtime activities
e) Out of school activities
f) Environmental action considerations
g) Peer issues
h) Personal qualities
i) Year 8 characteristics
j) Year 9 characteristics
k) Year 10 characteristics
l) Year 11 characteristics
m) Environmental education at school
n) Short term focus

a)Expectations pupils had about the biology club

Evidence from the year 10 interviews did not point to consistency in the expectations pupils had when joining the club. Two of the girls could not recall having any expectations; they had come along with friends, and open minds. Alison was the only pupil to focus on the expectation of learning more about the subject from participation in the club; she anticipated being able to experience material that she would not normally come by in the normal course of lessons. This response was similar to that given by Kristen. Due to her observation of the school reserve and personal interest in animals, Sandra had expected to take part in activities that would combine the two. These responses were similar to those she gave in Year 9.

As a number of the pupils had expressed last minute decisions about joining, with much influence from their friends, it appeared that expectations played an insignificant role in the process of attraction towards and subsequent participation in this school club.

b)Non-participants perceptions of the club (participants' perceptions of)

Originally, this category had been split into 2 sub-categories, one academic and one stereotyping. However, when the relevant coded passages were reviewed, it was evident that the units actually contained a mixture of academic stereotyping of the club and academic stereotyping of pupils who participated in the club; consequently, the categories were fused.

Kristen had highlighted non-participant perception of the club as a reason for the low attendance to meetings, and the reactions these pupils would give towards individuals who did participate. Between the two years of interviews, 5 of the 6 secondary key informants commented on the negative images they perceived others to hold (three in Year 10 and two in Year 11), with respect to the club and its activities. Kath, did not identify negative imagery perception, explicitly, her recognition of the dissenting judgements made of individuals who participated in such clubs was intrinsic in her response:

***Kath**: Yeh, erm, It's sort of like I don't know I wouldn't probably laugh at somebody who said they went to like chemistry club or something like that, I probably be like I don't know, go and say to Sarah like, 'Oh God, you don't wasn't to know about like Madeline she's going to Chemistry club' or something like that, and that's like really bad and I know it's really bad but I still do it* (Year11)

The remarks made here fed into more general questioning about factors that influenced decisions related to joining clubs at school.

c)Influences on pupils' interest in a club

The interviews disclosed 12 sub-categories of influence (Table 12). It appeared that the barriers to pupil participation in a club highlighted in the previous Year 9 interviews with the BioSoc participants (timing, day) were not now recalled as significant factors.

Table 12 – Influences on pupils' interest in a club

Influence on interest in joining a school club	No. of girls that referred to influence (Max. 6)			Pupils referring in both interviews[24]
	Year 10	Year 11	Total individual girls	
Novelty of club and participation	3	1	4	
Time of meeting (day, time of day)	1	1	2	
Lack of time to participate	2	1	3	
Workload	2	0	2	
Age Appropriateness	3	1	3	Lily
Peer Influence – positive (with friends)	5	2	6	Bronwen
Peer Influence – negative (criticism)	2	3	4	Lily
Interest in the subject	4	2	4	Sandra, Bev
Image projected by the club	2	0	2	
Apathy	1	0	1	
Responsibility for the club	2	2	3	Kath
Mass appeal – participant numbers	1	0	1	

They may have some bearing on the finalisation of choices but other influences seemed to hold greater weight. Similarly, workload is not a major inhibitor of club participation; interestingly, none of the pupils in Year 11 (when work pressure is usually much higher) raised this as an issue.

Strong influences were novelty, age appropriateness and peer influence. Positive peer effect was clearly very important to Bronwen. She had described her participation in the club as a result of friendly encouragement and her decision not to participate beyond Year 9 only became fully transparent when she referred to a very serious friendship upset that had taken place early in Year 10. Lily had been the most vocal about peer criticism and perception of her self by peers as an inhibitor to club participation. She tempered her response in Year 11 by commenting on the reduction of overt criticism from peers, but she was aware of its continuance in a more subtle manner. She was also the only pupil to explicitly state that the negative image projected by an academic club was undesirable:

***Lily**: Yeh, it kinda makes you seem boffy and you know it makes you seem interested in it! Which you don't want,* (Year 10)

[24] Names of pupils making a comment on the influence in both their Yr 10 and Yr 11 interviews

Four of the girls cited subject interest as an influence in joining a club. However, Bronwen and Lily did not refer to this in either of their interviews. They had joined to be with friends and subject interest had not been a critical factor. Lily reiterated her desire for group involvement, in the Year 11 interview; the fall in numbers had a negative impact on her desire to participate in the club.

Three pupils expressed the influence of the location of responsibility for the club on their interest. Bev described the partial autonomy, and consequently, partial responsibility, she experienced at her ranger unit. This approach to club organisation had been discussed in the Year 9 interviews, but had not translated very well into practice. Both Lily and Kath had found it very difficult to take responsibility for meetings; their experience of Year 8 pupils had left them with doubts about the effectiveness of such sessions. The result of this was that Kristen had taken on a leadership role, in order to bring some stability and to avoid returning to teacher led sessions. Kath reiterated her concern over extent of responsibility, during her Year 11 interview.

d)Lunchtime activities

The interviews were examined for evidence of activities that pupils took part in during their lunchtimes; a period in which most school clubs took place. Four sub-categories evolved from the interview transcripts (Table 13).

Table 13 – Preferred lunchtime activities

Lunchtime activity	No. of girls that referred to influence (Max. 6)			Pupils referring in both interviews
	Year 10	Year 11	Total individual girls	
Talking to friends and peers	5	4	6	Alison, Lily, Kath
'Resting the brain'	1	3	3	Alison
Internet use	2	2	3	Kath
School work/ Homework	1	1	2	

It was clear that talking with friends and peers was very important to the pupils. The lunch slot was 50 minutes from the first bell to the one that warned pupils to return to form rooms. The only other 'down-time' pupils had, during the day, was a mid-morning break, which was 15 minutes from bell to bell. This *free* time was precious to the pupils and became even more important for 'bonding' purposes once the pupils had progressed to Year 10 and were split into option classes for examination subject teaching. This time was less likely to be used for catching up on or discussing work, than catching up with friends and discussing the weekend social calendar.

<u>e)Out of school activities</u>

Over the two years, all six girls referred to having various interests during their own time, be that after school or at weekends. Five of the six girls were specific about 'shopping' being a feature. There was less elaboration on activities during the Year 11 interviews than in the Year 10 interviews. This may have been due to changes in social interests:

***Sandra**: Erm I think a lot of people have got jobs now and that's they think that's important but you know, it's not so much shopping it's going out and getting drunk and stuff which I mean, you know, nobody did that in Year 8.*

***Interviewer**: Right that's good!*

***Sandra**: but a lot but a lot more people do it now and erm, I mean it's not really important but it's important to have fun.*

(Year 11)

In Year 10, four of the girls conceded that boys were taking up more of their time; in Year 11 there was no reference to boyfriends. Three of the girls described family activities taking up some of their time, whereas in Year 11 only one pupil referred to the time she spent with her parents and other close family. Kath described her unwillingness to declare this to her peers, she felt embarrassed about taking part in family walking excursions, however, she recognised that she did enjoy them and so continued to participate in them. She described how she and her friends went on long walks rather than going somewhere that required money. This, too, she felt embarrassed about revealing. When asked why she felt that it was something to be embarrassed about she replied with a response that indicated a stereotyping of peer group 'down-time' activity:

***Kath**: Erm, yeh, we're quite 'cause it's like a cheap day out really if you're going on a walk somewhere, so it saves you money and like well, try and get fit (giggles) Going on a walk things like that, like we used to like, instead of getting like a McDonalds, we used to go and sit in (town name) park with like sandwiches and things like that, just like watch all the birds and everything (pupil giggles whilst speaking) sounds really sad doesn't it? (Pupil blushes and continues to giggle)*

***Kath**: cos it's not like what other young people do! is it? really?*

***Kath**: Like go shopping or like go out, not like go on a walk (giggles)*

(Year 11)

f)Environmental action considerations

During the course of the interviews, pupils identified factors they felt they would take into account when considering taking part in environmentally responsible behaviour (Table 14). They discussed the likelihood of them acting in either direct (such as conservation projects) or indirect (such as letter writing) ways with the intention of showing they were willing to '... *take responsibility for the care and management of the environment* ... ' (Tilbury, 1995). The examples of behaviours that arose during interview

discourse included food purchases, taking part in organised action (such as with NGO's) and transport choices.

Bronwen commented on possibility of her acting in the future when she might care more about environmental issues because of having children of her own, however, she included the proviso that her family and work would come first and then, if she had 'time', she would think about environmental actions. Sandra used lack of time in answering a question about her change in concern over environmental issues. Her response indicated that she considered time restrictions were impacting on her 'thinking space' and consequently, she was prioritising and using time to worry about 'more important things'. In general, pupils found time to take part in activities in which they chose to be involved; 'leisure' time was not so used up that they had to sacrifice actions in which they wished to participate.

Table 14 – Environmental action considerations

Factors taken into account for participation in action	No. of girls that referred to influence (Max. 6)			Pupils referring in both interviews
	Year 10	Year 11	Total individual girls	
Time issue	1	1	2	
Skills knowledge	3	1	3	
Degree of effectiveness	2	3	5	
Size of issue to act on	2	2	3	
Mass appeal – participant numbers	3	3	5	Sandra
Effort required	3	3	4	Sandra, Kath
Personal Investment	3	2	4	Bev
Media/personality involvement	2	0	2	
Type of action	1	1	2	
Secure outcome of action	1	0	1	
Perceived *barriers* to behaviour	2	4	6	

Other factors that were raised by all pupils as perceived *barriers* to their action, that is influencing their intent to act, included the following:

- External locus of control:
    - Produce suppliers' control
    - Parental control
    - Produce availability
    - Cost of action
- Habit/familiarity

Five of the girls also referred to the effect of communal action. The remarks made called for widespread EE to be followed by widespread action. Pupils need to see that other people are taking part in the action, both at a local and a global level. Linked to this is their perception of non-communal action and, consequently, of the ineffectiveness of the individual. The passages that were coded for this factor nearly all contained references to the futility of personal action by the individual when compared to the size of the problem. The only pupil to use a different approach to ineffectiveness was Bronwen. She remarked on the futility of potentially ameliorative action due to her belief that environmental problems had already *'passed the point of no return'*. This remark occurred in her Year 11 interview, the same interview in which she exposed a fatalistic streak in talking about potential wars and attacks on Britain.

Two other factors, that were raised by more that half the group, were personal investment and effort required for action. Pupils would be willing to apply themselves to actions that require more effort if they felt they had a greater personal investment in the issue, with the girls indicating that the smaller the effort the more likely action would be forthcoming from the individual. The western science 'tradition' of dismissing emotions and feelings in order to ensure rigour may contribute to the pupil perception of the

irrelevance of science in their lives (Nicholson-Lord, 2004) and thus the impersonal nature of an environmental issue; ultimately maintaining the 'self-environment' dualism. Personal investment indicates some degree of feeling. Bev remarked on the concern she felt for communities in Africa trying to find freshwater and food. This was not a local issue but she felt sympathy for the individuals portrayed on the programme and had responded by taking part in the related 'Blue Peter Appeal'. The term sympathy is selected over empathy in this instance as Bev had not expressed her understanding of these individuals' feelings, but had referred immediately to how enough money was going to be raised to help them. Her affinity to these individuals as fellow human beings had allowed her to share their feelings and encouraged her to act in some way to alleviate their suffering. She had expressed a connectedness to other humans that she did not have with non-human environment; issues that affected humans impacted on her sensitivities to a much greater degree. She asserted the need for awareness of how issues affect the individual before interest and consequently action is taken. The awareness being called for included both a cognitive and affective element that is more like that expressed by the use of the term *'Umweltbewusstsein'* (p258, Kollmuss and Agyeman, 2002).

Sandra, Bronwen and Kath raised two further factors that they would consider before taking action. The size of the environmental issue had some bearing on their intention to act, as did their skills knowledge. The girls felt that large-scale or more global issues were out of their, effective, reach. Scale was referred to in terms of time as well as geography. In Year 11, Sandra justified her lack of issue concern by commenting on the difficulty she found in 'feeling' about something that was so far into the future. The need for closer proximity, both in terms of space and time, to environmental problems in order for 'feeling' to be generated in an individual has been identified in other studies (Krause, 1993).

g & h)Peer issues and personal qualities

In the Year 10 interviews half the sample discussed how both popularity and image projection were issues that affected pupils. Popularity was described by referring to groupings of individuals that existed, and how particular groups were perceived as being popular for the clothes they wore, the team sports they were involved in or the effect they could have on class 'voting' activities. Image perception was linked to pupils' behaviours and how others interpreted these behaviours. In the Year 11 interviews only two pupils made explicit references to popularity issues, however, four pupils did refer to image perception issues. The negative feedback given by peers was often enough to prevent a particular behaviour occurring again.

Not all peer criticism related to perception of an individual's image was inhibiting to behaviour. In the Year 11 interviews the pupils that identified image perception as a continuing problem described it's reduction in intensity, with the more work-focussed pupils, not being admired, but being held in some esteem with their academic skills now holding currency with pupils heading towards external examinations.

The friendship group that Kath belonged to placed a high value on the relationships they had within the group; it was small in size, intimate in knowledge (they had known each other since primary school) and distinct from other groups in her description of their behaviours. Kath expressed some anxiety over academic comparisons made by pupils. She recalled being told that one shouldn't boast; this was part of her value system. During informal, opportunistic, conversations with me, Sandra had expressed her negativity towards the school's competitive atmosphere. Both these girls, along with Susie and Lucy, left the school because of this aspect of their selves, putting relationships above academic competition, reflecting comments made by Gilligan (1993).

All four pupils had decided to leave the case study school, to 'migrate' from it and enter into a different education community. In leaving, these girls, who had been critical of

the highly academic environment of the case study school community, expressed their desire 'not to conform' with traditional community ideology (Jones, 1999) but to change the physical environment that was in conflict with this aspect of their selves. On average 15 individuals (from a year group cohort) would leave the school at the end of Year 11, these four members of BioSoc (no matter how short-lived) made up over 25% of their year group migration. It is suggested here, that the factor identified in their attraction to BioSoc is consistent with the factor (in absence) identified as instigating their migration – an emphasis on an *ethic of care* rather than an *ethic of justice*.

As some of the pupils had made references to the pressures they felt would prevent them acting in certain ways, the interviews were explored for points at which the pupils indicated personal characteristics that could account for their continued involvement in an academic school club for at least two years. Four main sub-categories (of the main category – Personal qualities) appeared from the transcripts, echoing aspects of the interview with Kristen –

Confidence

Values

Self-centredness

Self-reliance

Three pupils described themselves as confident individuals. Two of these were long standing members of the club (Bronwen and Sandra). Two pupils highlighted environmental values they held. Kath related the high value she placed on having a garden or access to a park, and it's influence on youth environmental behaviour. She articulated a sense of sadness for individuals who lived in 'flats', expressing a sense of incompleteness without access to this aspect of one's 'dwelling' (Bhatti and Church, 2001); Kath hoped for respect, from her future children, for their surrounding area and their access to a *nice* garden. Three pupils openly referred to their self-centredness in interview. Lily (in Year

10) explained that she only pressured her parents when it was for a self-serving purpose. Bev and Sandra (in Year 11) admitted that they were only concerned about their lives, Bev even commenting that she did not worry about the next generation, only her next 50 to 60 years were important to her.

Interestingly, in at least one of their interviews, all six pupils expressed characteristics that have been coded as 'self-reliant'. Passages coded under this term were expressions of independence, ability to stand on one's own feet and self-sufficiency, all emphasising strength of character that enabled them to behave in ways they wished, regardless of reaction.

All of these girls had described the potential inhibitory effect of peer pressure on one's actions, however, their transcripts also contained passages that suggested such pressures would not force them to behave in a particular way. This aspect of their character seems to have developed over the four years they spent in the case study school during this research project. Within the interviews the pupils linked friendships they had (which became deeper and more secure as they grew older) with their self-reliance. It appears that their ability to be independent and act 'against the crowd' developed as they became surer about their close friends; consequently it was a characteristic that did not appear until later in their school life. To crosscheck the reliability of this developing characteristic the transcripts were reviewed again and coded for characteristics the pupils associated with themselves as they moved through their school years (Tables 15, 16 & 17).

i, j, k & l)Pupil characteristics linked to year group

Pupils described how they thought they and their peers had changed as they moved from Year 8 to Year 11; consequently, there is less a retrospective look on Year 11, rather a reflection on the few months prior to, and the current feeling of the girls in, the Year 11 interviews. The most significant change from Year 8 to Year 11 was that pupils felt more

secure in their established friendship grouping. There had been some minor upsets between peers in Year 8, which had clearly made an impression on Bev, although she had not been involved. Bev thought that friendships had stabilised much since then and this was echoed by Alison who commented on the fact that her tutor group had been the recipient of new tutees, as upsets had occurred elsewhere in the year group. The pupils described how joining clubs in Year 8 helped them to meet people and make friends. The four, consistent, secondary key informants had all referred to the influence of friends on joining BioSoc and taking part in the reserve conservation weekends. The common insecurities felt by the Year 8 pupils led them to explore potential friendships and the practical activities provided bonding opportunities outside of the confines of curriculum led lessons.

Table 15 – Characteristics associated with Year 8 pupils

Characteristic of Year 8	No. of girls that referred to influence (Max. 6)			Pupils referring in both interviews
	Year 10	Year 11	Total individual girls	
Nervous/insecure	1	4	4	Alison
Unfamiliarity	3	2	4	Lily
Lacking split friendship groups	2	3	3	Sandra, Kath
Lack popularity issues	2	1	3	
Dependents	1	1	2	
Upsets – not serious	1	1	1	Bev
Talk is school oriented	1	0	1	
Enthusiastic about school	2	3	3	Sandra
Superficial nature of relationships	0	2	2	

Partly due to the novelty of the school and the unfamiliarity of the peer group, half the pupils described a definite lack of popularity issues in their first year of secondary school. Pupils were preoccupied with getting to know others and forming friendships in a strange environment so that there was less opportunity for focussing on the detail of the image being projected by certain individuals. There was also less attention drawn to those attending academic type school clubs, as many of their peers would be participating in clubs at the same time.

Alison and Sandra situated the formation of distinct and stable friendship groups within Year 9, at which point it seems boys were beginning to generate more serious attention from the girls. Once in Year 10 the pupils described characteristics that suggested further development and maturation of relationships within the year group (Table 16).

Table 16 – Characteristics associated with Year 10 pupils

Characteristic of Year 10	No. of girls that referred to influence (Max. 6)			Pupils referring in both interviews
	Year 10	Year 11	Total individual girls	
Independence	2	1	3	
Image concern	4	0	4	
Upsets – more serious	2	2	3	Kath
Secure in status	2	1	3	
Influence of friends effective	2	1	3	
Talk is **not** school oriented	1	0	1	
Split friendship groups	3	0	3	
School unenthusiastic	1	2	2	Alison

By year 10 the pupils had become more independent of their peer group *en masse*; being different or 'odd' did not concern them so much now. Smaller, closer friendship groups provided security of status to the pupils. Familiarity with the school and with individuals had removed the anxiousness of Year 8 and allowed pupils to develop stronger and deeper friendships. Consequently, if upsets occurred, they were generally more intense.

With smaller friendship groups came more concern over self-image. In the Year 10 interviews, four of the pupils referred to at least a sense of tension (in some cases more overt behaviour) that was a result of conflict between individuals with very 'individual' self-identities; consequently, image projection was quite distinct. Talking revolved around less school oriented subjects, such as work, but had evolved into a more socially oriented discourse, which was important in maintaining bonds between pupils. A number of them commented on being concerned about what their close friends thought but not caring for others. Kath's response suggested that when considering feelings of those in other

friendship 'groups', that is not in her 'in-group', there was a lack of engagement of her feelings. Kath was not expressing concern over a lack of approval by others, which is what one would expect if she had stayed at the lower level of moral reasoning suggested by Kohlberg. This lack of 'ethic-of-care' approach is consistent with the importance of social context influence on self-other relationship for moral reasoning described by Ryan *et al* (2004).

Alison and Sandra referred to the preoccupation with work that was characteristic of Year 8, and how this had declined into Year 10 as they had settled in. Sandra commented on the decline in pupils' enthusiasm to take part in voluntary school activities during their own time; it appeared that school image was changing in their eyes, from a more holistic experience of education to a more qualification centred institute to be attended.

Towards the end of their final year of compulsory education, the six pupils reflected on characteristics they considered were indicative of the stage they were now at (Table 17). They were very focussed on the completion of the previous two years of study, with their external examinations (G.C.S.E.) looming on the horizon. Friendships were described as strong and more exclusive in terms of the numbers of individuals that pupils would consider close. They were more honest with their friends, not feeling the need to 'play it cool' as they had done in Year 8 (a time of superficial relationship building). Bev explained that this was important, as they would soon be leaving school and moving on to other things, more secure in the knowledge that they had a good, solid friendship base behind them; a security, a 'sureness', that allowed them to be independent of their peers.

The pupils expressed weariness with the position they found themselves in, their formal education almost complete but with examinations yet to sit. Sandra explained that the feeling was in contrast to that felt in Year 8 when the school was new and studies were

still an unknown quantity. Kath remarked that the time was right for a change, after four years in the same institute.

Table 17 – Characteristics associated with Year 11 pupils

Characteristic of Year 11	No. of girls that referred to influence (Max. 6)
Examination focussed	4
Secure in status	4
Friendship groups well developed	4
Depth to talk and relationships	2
Independents	2
Social aspects emphasised	3
School weary	2

All 6 pupils contributed to these categories.

m) Pupil opinions of Environmental Education at the case study school

In both sets of interviews pupils reflected, to differing degrees, on the EE they had participated in at the case study school. A series of sub-categories were coded out of the comments made (Table 18).

During individual interviews, Alison and Lily both stated (Yr 10) that environmental action was brought about immediately by recent EE activities, for instance, turning off lights to reduce energy use; however, these actions would not be long lasting. Alison had opined that some individuals would not act on their beliefs due to excuses of time constraints (what is the psychological influence on this belief?), having something else to do or not being 'bothered' (lack of full will), and, consequently, found it easier to fall back on behaviour they had been performing for a long time (habit). Behaviour can be very difficult to change, even if that change would bring about more advantages.

Table 18 – Comments made about Environmental Education in the case study school

Categories of comments made on Environmental Education at the case study school	No. of girls that referred to influence (Max. 6)			Pupils referring in both interviews
	Year 10	Year 11	Total individual girls	
Disaffection*	2	2	4	
Disengagement**	3	1	4	
Repetitive	2	1	2	Bronwen
Ineffective	2	1	3	
Temporary influence on pupils	2	0	2	
Predetermined rules	1	2	3	
Disempowered	2	1	2	
Conflicting information#	2	0	2	
Lacking action aspect	1	3	4	
Increase issue knowledge	4	4	5	
Encouraged thinking	2	3	5	

*Alienation from environmental matters and the education process involved. Hostility towards it - resentment of it.

**Disconnection from the environmental education process. Not really hearing, writing - not attached, linked to the process.

#Environmental science is not always consistent. Teachers may preach ways to act but don't do it themselves

n) Short term focus

Five of the six pupils made explicit references to the projected timescale in which they placed concern. All the remarks were made during the Year 11 interviews. Bronwen, Bev, Lily and Sandra made it very clear that they were concerned about the present and near future (no more than 6 months away). They were concerned about:

- Organisation of work
- Their current circle of friends and themselves
- The new term in September/starting college (interviews conducted in March)
- G.C.S.E examinations in the summer term

This emphasis on the short-term is echoed in the temporal shift seen in Year 11 freewriting comments (section 4.4.2.3). Only Alison explored her thoughts over the medium to long term. She had already considered the degree subject she would like to study and had gone on to explore the possibility of living abroad after she achieved her degree.

5.3 The Questionnaire

5.3.1 Conditions of the Questionnaires

The paper and pencil instrument that was produced was shared with another educator-researcher, resulting in re-writing and revision, before being passed onto teachers in the case study school for comment. These teachers comprised of a Head of Science, the Head of Year 9 and a student teacher. No revisions were deemed necessary. The questionnaire was then trialled on two classes of pupils in the case study school from which no revisions were identified as required. The instrument had to be concise and able to be completed in a short time.

Questions 1 and 2 were included for basic categorisation. Questions 3 and 4 allowed information to be gathered on items that were 'flagged up' in interview as potentially having some influence on the individual in relation to their approach to environmental issues; pet-ownership and the socio-economic implication of location of residence have been identified elsewhere as factors that are likely to influence individuals' reactions to the environment and environmental issues (Hines *et al*, 1986; Eagles and Muffitt, 1990; Prelle and Solomon, 1996). Questions 5 and 6 could be used to compare individuals that considered themselves members of environmental/biological clubs to those who knew of them but did not have such an affiliation. The scale statements, on the questionnaire, numbered 7 to 36 were chosen to represent aspects of environmental attitude. The term 'attitude' is being used here as an indication of *positiveness (favourable)* or *negativeness (unfavourable)* of a conglomeration of affective, conative and cognitive components (Eiser, 1980). As the questionnaire was carried out in a school classroom, without visual stimulus of specific statement contents, '*... one may suspect that all their responses will be mediated by the cognitive system...* ' (p56, Eiser, 1980).

In 2001 all Year 8 pupils, in form groups, carried out the questionnaire at the very beginning of a biology lesson in the autumn term. This year group consisted of 7 forms, the

largest year group in the school. One biology teacher taught three of the forms; the other four forms were split between two other biology teachers (one being myself). The feedback from the two other teachers suggested that, taking into account the 'settling down' time and the 'collecting in' time allowance needed, in addition to the 10 minutes for completion of the questionnaires, the teachers preferred not to have to do this again with any other groups during academic lesson time. To rule out the 'novelty' aspect of the task, the teachers concerned agreed to try this activity once more with the Year 11 groups in 2002. Similar problems occurred and it was decided that an alternative to *academic lesson time* was required. Curriculum time is restricted and a common complaint from teachers in the case study school is not having enough time to 'deliver' their subjects.

Consequently, for subsequent questionnaires, I negotiated the use of *tutor time* from the pastoral aspect of the timetable. The questionnaires were provided to the form tutors during the second half of the autumn term each year and were generally completed within a 2-week period. The only year group that took longer than this was the Year 11 2003 year group, where the researcher needed to provide two tutor groups with further copies of the questionnaire and a little more encouragement to ensure their completion. This was due to various staffing changes that affected the continuity of tutor time for these two groups. In all cases the pupils were asked to respond honestly, not to confer with anyone and to complete the task under 'examination-like' conditions. This was intended to encourage the reflection of their own, real, views in their answers.

During analysis, a number of cases (pupils) were excluded due to incompletion as one or more of the scale statements had not been answered. This reduced the samples sizes to those recorded in Table 19. Questionnaires were anonymous. The decision to follow this course was taken due to pupils' negative responses to external questionnaires when asked for personal details that were, potentially, traceable. All of these conditions go some way to dealing with issues associated with questionnaire planning (Oppenheim, 1992).

Table 19 – Samples sizes for questionnaire completion

Year group		No. of questionnaires collected in	No. of questionnaires unspoiled
Year 8	2001	182	174
Year 8	2002	161	152
Year 8	2003	173	166
Year 9	2002	179	170
Year 9	2003	155	152
Year 10	2003	172	171
Year 11	2002	123	117
Year 11	2003	139	134

It was not appropriate to design a complex instrument that required a greater length of time for pupils to consider ranking items. The purpose of this instrument was to cover as much of the evidence provided by the key informants as possible in such a way that would not be cumbersome; this would help ensure a high percentage of informative returns. Unlike the New Environmental Paradigm (NEP) scale, which used NEP-oriented literature and 'knowledgeable individuals' to form statements (Dunlap, 1978), the questionnaire, in this study, held statements that were derived from interview evidence with key informants and from free-writing data. In this way it was hoped that a better understanding of the reality of the situation in the case study school would emerge, rather than the reality that would be suggested by using a questionnaire designed for a different place and time (Hillcoat and Forge, 1995).

Consequently, this questionnaire is not seen as transferable, and is likely to become less useful at the case study school over a long period of time, due to social changes that will be reflected in changes in the pupils attending the school. Unlike some formal questionnaires that the pupils are used to completing, the intention in this study was to try to limit the barrier between answering as one saw socially appropriate, and answering more closely to the way one felt (La Trobe and Acott, 2000); the statements remained close to 'pupil-speak' rather than trying to emulate statements clearly aimed at adults (Lalonde and Jackson, 2002).

The statements were characterised by variable categories (Table 20a) that are considered to be involved in the process of environmental behaviour *determination* in an individual. The statements in the questionnaire represented one or more of each of the variables. Rather than being able to predict specific environmental behaviours carried out by the pupils answering the questionnaire, what is indicated is an overall environmental 'attitude' held by the individual. The values obtained were required to be used comparatively only and not to assess attitude-behaviour compatibility (Eiser, 1980). The statements contribute to a form of general 'attitude' scale, the statements and thus the variable categories contributing to the final environmental 'attitude' score. Continued interviews and researcher knowledge of activities within school would provide a 'narrative' to use in conjunction with the questionnaire data.

The set of variable categories represented in the questionnaire statements were determined using a combination of characteristics that emerged from the interview transcripts (Chapter 4, Figure 17; Chapter 5, Table 14) and factors identified, by other researchers in the field of environmental education research (Sia *et al*, 1985; Hines *et al*, 1986; Hungerford and Volk, 1990; Newhouse, 1990; Gigliotti, 1992; Palmer and Suggate, 1996; Connell *et al*, 1999; Eagles and Demare, 1999; Lalonde and Jackson, 2002), to be involved in, or influencing, the 'stand' taken by individuals towards environmental issues.

As stated, these categories are not being used as predictors of environmental behaviour (Sia *et al*, 1985; Sivek and Hungerford, 1990; Newhouse, 1990), rather they are being used to try and better understand the situation at this case study school, by exploring the pupils' written expressions of, and association with, these variable categories; that is to say their overall environmental 'attitude' (the evaluative dimension).

Table 20a – Variable categories influencing environmental attitude

Variable Categories	*Code*
Environmental Sensitivity/Feeling for environment	*ENS*
Knowledge based beliefs of/about environmental issues	*KEI*
Personal Investment in issues and the environment	*PII*
Beliefs about environmental action (+/-)	*BEA*
Locus of control	*LOC*
Intent to act for environment	*ITA*

A Likert-type scale was used for pupils to indicate their position on an agreement continuum with a statement. By using this scaling procedure it is possible to *'...place individuals along a single dimension of affect by considering their responses to a set of items assumed to reflect this underlying dimension. The derived attitude score represents the person's location on the evaluative dimension.'* (Fishbein and Ajzen, 1975). The statements fell into 9 main groupings (which emerged from the qualitative evidence), contributing to the evaluation dimension, based on the variable category combinations they represented (Table 20b).

These were given scores ranging from 1 to 5. Statements 8 to 36 were used as a scale to calculate an overall environmental 'attitude'; a large number of items to reduce error and provide a value that should approximate to the *true* 'attitude' score. In this study, the lowest score was given to a favourable response and the highest score to an unfavourable response; scores of 3 indicated a 'neutral attitude'. Statements that were evaluated as environmentally unfavourable were score reversed (statements - *8,19, 24, 25, 26, 27, 28, 31, 32, 33, 34* and *36).* The widest score range ran between 29 (most favourable) and 145 (least favourable).

Table 20b – Variable category combinations represented by questionnaire statements

Grouping - *Statements inquiring of:*	Variable categories in statement	Statement	Summary of statement content	Notes
evaluation of environmental issue knowledge and understanding	KEI & BEA	9	Recycle waste material	*Spread of issues from the very local to the very global*
		12	Motorway building	
		13	Car use	
		14	Deforestation	
		17	Species loss	
		18	Overpopulation	
		19	Natural disasters	
		20	Non-renewable resources	
		16	Global warming	
	KEI & BEA (& PII)	11	Graffiti/vandals	
evaluation of time implication	BEA & ITA	24	Too busy to act	*allows consistency check***
		31	Not enough time	
		26	Rather be with friends	
		27	Act less now	
evaluation of power and action effectiveness	BEA & LOC	21	Everyone can act	
		28	Ineffectiveness of their action	*allows consistency check***
		35	Everyone's action are effective	
		32	Transfer of responsibility for action	
affective engagement in issues	ENS & KEI	10	Concern over local/national issue	
		15	Concern over global issue	
		34	Issues are over exaggerated	
prioritisation of environment with respect to social aspect	ITA	22	Talk about issues with family	
		23	Talk about issues with friends	
		25	Shopping priority over environment	
evaluation of role-model environmental action	ENS & BEA	30	Admiration for eco-activists	*allows consistency check***
		33	Concern over eco-activists	
evaluation of change in concern	ENS & PII & ITA	29	May care more when a parent	
	ENS	8	Lost interest in environmental issues	
EE recall*	KEI	7	Memory of primary EE	
evaluation of Youth voice	LOC	36	Adults don't listen to youths	

*This statement was withdrawn from the attitude scale calculation; effect on pupil may be of significance to attitude in Year 8 but not necessarily so as pupils grew older and recall of primary school occurrences decreased naturally.

**Appendix XIX

The statements that form part of the scale were tested for reliability with each of the year groups that completed the questionnaire. Cronbach's alpha coefficient was calculated for each year group (Table 21), using SPSS v.10 (SPSS, 1999). The value of the alpha

coefficient being used as a level for relatively high internal consistency is 0.7 (Pallant, 2001).

Table 21 – Degree of internal consistency for questionnaire

Year group Cohort	Cronbach's alpha coefficient value
Year 8 2001	0.82
Year 8 2002	0.80
Year 8 2003	0.85
Year 9 2002	0.85
Year 9 2003	0.82
Year 10 2003	0.86
Year 11 2002	0.84
Year 11 2003	0.82

All these scores are above 0.7 and so indicate internal reliability

The 'corrected item-total correlation analysis' was searched in each year group for statements that did not correlate very highly with the overall score. There were one or two statements in each year group that could have been removed from the scale to improve the coefficient value. Each of these statements, in their absence, would improve the coefficient only slightly (adding a value of 0.01); they were checked in year group correlation matrices for correlations with other questions. Only one statement, whose absence would improve the coefficient value, was isolated when checked against the correlation matrices for each year group because it did not achieve a correlation coefficient of 0.3 or greater with any other statement. The statement (Q11) was re-evaluated, and it was decided that too much of the response it would generate would rely on the factual (vandalism, graffiti) difference between one area and another. The statement was determined to be neutral and removed from the scale for these reasons. All other statements were kept in the scale. Consequently the widest score range changed to run between 28 (most favourable) and 140 (least favourable). Cronbach's alpha coefficient was re-calculated for each year group (Table 22). The multiple data sources have contributed to construct validity (Tellis, 1997); a list of these can be viewed in Table 6 in Chapter 4.

Table 22 – Internal consistency re-calculated

Year group Cohort	Cronbach's alpha coefficient value*
Year 8 2001	0.83
Year 8 2002	0.81
Year 8 2003	0.86
Year 9 2002	0.86
Year 9 2003	0.83
Year 10 2003	0.86
Year 11 2002	0.85
Year 11 2003	0.84

All these scores are above 0.7 and so indicate internal reliability

During 2001 and 2002, pupils and staff were invited to provide me with verbal feedback as to the need for changes/improvements to the questionnaire. Staff who responded on an informal basis reported that pupils did not ask for help or clarification of statements and the time provision was appropriate. In 2003 a written feedback form was included in each questionnaire pack given to every form. This allowed pupils to indicate to their form representative if they had any problems completing the questionnaire. It was thought that giving the pupils the opportunity to talk to a peer about any problems might encourage them to come forward, rather than reporting back to an adult. These comments were taken into consideration in the analysis of the data.

5.3.2 Analysis of questionnaire responses

The year group scores were checked for distribution before statistical analysis was attempted. All year groups showed normal distribution in the responses collected. All, except one, indicated positive skew (Year 8 2003 indicated negative skew); so, generally, the scores clustered to a certain degree towards the lower score end, a more favourable environmental attitude. The Kurtosis values were positive for each group and should not lead to underestimation of variance. The *range* of scores differed slightly across the groups (Table 23).

Table 23 – Questionnaire score summary table for each year group

Year group		Mean score	Minimum score	Maximum score	Score range
Year 8	2001	67.9	44	102	58
Year 8	2002	70.31	45	107	62
Year 8	2003	73.43	44	110	66
Year 9	2002	70.71	44	108	64
Year 9	2003	76.02	49	115	66
Year 10	2003	75.25	45	123	78
Year 11	2002	70.81	44	107	63
Year 11	2003	76.21	46	114	68

5.3.2.1 T-tests on mean questionnaire total scores

Comparisons of the mean scores for each year group were carried out. Due to the anonymity of the questionnaires, and effects of pupil migration in the education system, it was not possible to directly compare individual responses from one year to the next, however, year group mean environmental 'attitude' scores could be compared using the independent t-test. The size effect of any statistically significant differences in the mean scores was checked using eta squared:

$$eta\ squared = \frac{t^2}{t^2 + (N1 + N2 - 2)}$$

Where t is the value from the t-test calculation, N1 and N2 are the population sizes of the two samples being compared; 0.01 = small effect, 0.06 = moderate effect and 0.14 = large effect (Pallant, 2001).

Comparisons were made of the mean scores in the Year 8 cohorts, this time in the absence of the scores provided by pupils who responded positively to Q6 (pupils who confirmed membership of a school environmental or biology club). This made very little difference to the values calculated (Appendix VIII) and, consequently, the interpretation.

This set of comparisons consists of pupil groups compared with themselves in subsequent years and, also, year groups compared against other groups of pupils of a comparable age.

The first group showed increase in the mean total environmental 'attitude' score of pupils as they moved from their entry year, Year 8 2001, through to Year 10 in 2003 (Table 23). Interestingly, although the minimum score only changed by one point, by the third year the maximum score had increased by 21 points. With the t-test, this suggests a significant shift from more favourable environmental attitudes to less favourable attitudes over the three years.

Year 8 2001 had a slightly lower mean score than Year 8 2002 (this difference is statistically significant). In addition to this, as Year 8 2002 group moved through to Year 9 2003, their mean score increased to a greater extent that the increase seen with Yr 8 2001 to Year 9 2002. To summarise, Year 8 2002 appeared to have less favourable environmental 'attitude' scores than Year 8 2001, and the former group of pupils also showed a greater shift towards less favourable 'attitudes' as they went from Year 8 to 9.

In their written responses the Year 8 2003 pupils expressed environmental 'attitudes' that led to a mean score greater than that with Year 8 2001 (statistically significant). That is to say, Year 8 2003 pupils appeared to have less favourable environmental 'attitudes' to those of Year 8 2001.

The highest mean score is found with Year 11 2003, and statistically significant differences are found between this group and all of the Year 8 group scores. However this significant difference declined when comparing scores with the Year 9 and Year 10 groups. The Year 11 2002 mean score was significantly lower than that of Year 11 2003; the former group had the lowest complete questionnaire total of all groups, it may be that spoiled questionnaires would have contributed to a higher scores and, consequently, this calculated mean score may be somewhat biased.

The data suggests that overall environmental 'attitudes' become somewhat less favourable as pupils move from Year 8 through to Year 11.

5.3.2.2 Scores for members of environmental and biological clubs

Pupils who had indicated they were a member of an Environmental or Biology club at school, were isolated from the full set of data and the distribution of their total environmental 'attitude' scores were found to be lower than any complete year group scores. Only 2 of the 22 pupils in this sample belonged to Year 9, the rest were Year 8 pupils.

The two Year 9 pupils came from different cohorts, one in 2002 and one in 2003. Their scores were 53 and 52, respectively, identifying these two pupils as having much more favourable overall environmental 'attitude' scores than the means for their year groups (70.7 and 76, respectively). With the minimum score in Year 9 2002 = 44 and in 2003 = 49, it was evident that these two pupils were amongst those having the most favourable environmental 'attitude' scoring pupils in their respective year groups. As the questionnaires were anonymous, it is not possible to discern if the two Year 9 pupils were retained from their corresponding Year 8, consequently they have been left in the frequency histogram. When these two pupils are removed the mean value for the whole sub-sample (now 20 individuals) rises very slightly. Both distributions (with the Year 9 pupils and without) are normally distributed (using Kolmogorov-Smirnov statistic, values >0.05 and Q-Q plots with reasonably straight lines).

The mean scores for each of the sub-samples of Year 8 were lower than their corresponding mean for their whole cohort (Table 24). In summary, at least 60% of Year 8 pupils who identified themselves as members of Biology or Environmental clubs provided responses to the questionnaire that placed them in the lower half of their year group, that is more favourable, for environmental 'attitude' scores.

Table 24 – Mean environmental attitude scores for club members compared to year group means

Year group	N	Mean total score for Q6 sub-sample (belong to club)	Lowest score in sub-sample	Highest score in sub-sample	Mean score for whole year group	Percentage of sub-sample with score below year group mean (%)
Year 8 2001	5	67.4	53.0	88.0	67.9	60
Year 8 2002	8	65.13	49.0	78.0	70.3	75
Year 8 2003	7	60.4	44.0	85.0	73.4	71

5.3.2.3 Differences in response structures – Year 8 cohorts

Chi-square tests were carried out to explore differences in responses to specific statements (using SPSS v10). The comparisons explored through chi testing have been restricted to:

- following the same cohort year upon year
- comparing similar age groups of pupil (so successive year groups) i.e. Year 11 with Year 11, Year 8 with Year 8

Previous t-tests had suggested a small but significant difference between Year 8 2001 and Year 8 2002 (section 5.3.2.1) responses. This was followed up with chi-square testing, which suggested only three statements in the questionnaire had been responded to in different (statistically significant) ways by these two groups (Tables 25, 26 & 27).

Table 25 – Statement 13 ***(We need to reduce the use of cars)*** **–Year 8**

	Percentages[25] of responses** given by year group				
	1	**2**	**3**	**4**	**5**
Year 8 2001	32.8	49.4	12.6	4.6	0.6
Year 8 2002	19.7	53.9	13.8	12.6	0

**environmental 'attitude' score 1=most favourable 5=least favourable
Pearson chi square = 12.55 (df = 4) p=0.01

Year 8 2001 demonstrated much stronger agreement with the statement than Year 8 2002, whereas Year 8 2002 reported more disagreement with the statement. This is an evaluation pupils have made based on knowledge of issues and beliefs in particular actions.

Table 26 – Statement 27 (*I do less about the environment now than I did last year)* – Year 8

	Percentages[25] of responses** given by year group				
	1	**2**	**3**	**4**	**5**
Year 8 2001	13.8	50.6	24.1	9.8	1.7
Year 8 2002	6.6	39.5	32.9	18.4	2.6

**environmental 'attitude' score 1=most favourable 5=least favourable
Pearson chi square = 13.17 (df = 4) p=0.01

Year 8 2001 demonstrate stronger disagreement with the statements, whilst there was more agreement with Year 8 2002. The evaluation pupils make here is based on their beliefs about actions and their intentions to act, suggesting that Year 8 2002 pupils have translated less intention to act into less action.

Table 27 – Statement 29 (*I may care more about environmental causes when I have children of my own)* – Year 8

	Percentages[27] of responses** given by year group				
	1	**2**	**3**	**4**	**5**
Year 8 2001	6.9	43.1	30.5	14.9	4.6
Year 8 2002	13.2	43.4	34.9	7.9	0.7

**environmental 'attitude' score 1=most favourable 5=least favourable
Pearson chi square = 11.75(df = 4) p=0.02

[25] The chi square test was carried out on actual numbers of pupils, however percentage value gives a clearer illustration of relative differences recorded.

In this statement pupils are being asked to evaluate their 'potential' change in concern over environmental causes. This requires pupils to tap into their environmental sensitivity and consider how a more personal investment may influence their intention to act. In Year 8 2002 there were more pupils willing to agree strongly with the statement, suggesting they expected having children might significantly affect their environmental concern. The greater Year 8 2001 disagreement with this statement might be linked to the higher environmental 'attitude' score for this year as it stands.

These were the only three statements from the list of 29 that showed statistically significant differences in response distributions. This evidence supports the (small) difference (statistically significant) that has been found in the mean environmental 'attitude' scores of the two year groups.

There are many more differences between Year 8 2001 and Year 8 2003, however. Chi-square tests suggested 15 statements of statistical significance between the two year groups. This evidence supports the difference found between the mean scores of the two groups. Year 8 2001 project more favourable environmental attitudes in all of the statements identified. Literacy and Numeracy strategies had been implemented in 1999 (although it would have taken at least a single year run through for them to become fully functional), consequently there has been a little more restriction on the primary curriculum from 2000 onwards which may have impinged on cross-curriculum areas such as EE activities[26]. Pupils arriving at the case study school in 2001 would have had approximately 2 years of these strategies, whereas pupils arriving in the autumn of 2003 would have known these strategies for most of their school lives. Have the latter two Year 8 cohorts lower environmental 'attitude' scores any relationship to the implementation of these

[26] pers.comm. two case study feeder schools 18/06/03

compulsory strategies? - has freedom been lost at the primary level and has this affected the EE pupils receive early on? This phenomenon needs further enquiry.

5.3.2.4 Differences in response structure – Year 8 against Year 9

Chi square testing identified only 4 statements that were responded to in statistically significant different proportions between pupils in Year *8 2001* and the same pupils a year later, Year 9 2002. Statements 14 and 17, based on knowledge of issues and beliefs about environmental action, suggest a decrease in positive response by the pupils when in Year 9, that is a less favourable environmental 'attitude' expression. This is echoed by the rise in mean total environmental 'attitude' score (less favourable) from Year 8 to Year 9. The year group responses to statements 10 and 27 also suggested that, by Year 9, they were moving away from concern with more local/national issues and individual environmental action was decreasing.

Chi-square testing identified 15 statements that Year *8 2002* responded to in different distributions (statistically significant) a year later, *Year 9 2003*. These pupils responded in a more favourable way in Year 8 2002 than they did a year later. A greater proportion of pupils were negative in relation to talking with friends about environmental issues during Year 9 than had been in Year 8, and there was now, 12 months later, much more agreement with being too busy to act for the environment and prioritising shopping with friends.

5.3.2.5 Differences in response structure – Year 9 groups

Responses given by pupils in Year 9 2002 were compared with responses given by pupils in Year 9 2003, to compare between year groups at a particular age. Chi square testing revealed twelve statements that suggested statistically significant differences between the two groups; many more than those found between these two groups when they were a year younger. In all statements the Year 9 2002 group answered more favourably than Year 9 2003.

Responses to statements 13 and 27 reappeared as statistically significant differences between these two groups of pupils (see section 5.3.2.3). When statement 13 responses were analysed it appeared that the proportion of pupils in Year 9 2002 agreeing with the reduction of car use (two categories combined) had changed by less than 1%, however, within Year 9 2003, the proportion agreeing had declined by over 10% from their Year 8 responses. When statement 27 was analysed further the change in responses given by the two cohorts was distributed differently. Year 9 2002 distribution of responses resembled those given by Year 8 2002, that is to say pupils in the former year group seemed to *retaining* more favourable environmental 'attitudes' than pupils in the latter year group had demonstrated in their first year at the case study school.

5.3.2.6 Differences in response structure – Year 9 against Year 10

Year 8 2001 (Group 3, see table 11, p181) sat the questionnaire again in Year 9 2002, and then again in Year 10 2003. The comparison of their Year 8 responses to those they gave in Year 9 can be seen in section 5.3.2.4. As part of the longitudinal study their responses in Year 9 were compared to their responses in Year 10. Chi-square testing revealed 8 statements that were answered differently (statistically significant) from one year to the next.

The changes in response distributions from Year 9 to Year 10 for this group suggest a loss of strongly favourable attitudes and in a number of instances an increase in the unfavourable responses. There was a more than 10% increase in the proportion of the cohort that agreed that they were too busy to act for the environment; and a similar proportional shift suggesting a more sceptical attitude towards the environmental information they receive.

5.3.2.7 Differences in response structure – Year 10 and Year 11

Chi square comparisons of Year 10 2003 with Year 11 2002 and Year 11 2003 were carried out, and revealed 11 and 3 statements, respectively, that were answered differently (statistically significant).

The differences in responses revealed that the Year 10 year group (2003) was answering less favourably than the Year 11 2002 pupils. The questionnaire responses for Year 11 2002 contributed to their low mean environmental 'attitude' score, that is to say their written expressions were highly favourable towards environment. This favourable approach is echoed in the differences seen between them and Year 10 2003. However, as these year groups are not longitudinally connected it is not appropriate to make summaries based on these differences.

5.3.2.8 Differences in response structure – Year 11 groups

Chi square testing was carried out between responses from Year 11 2002 and Year 11 2003; 11 statements were revealed as answered differently (statistically significant) by the two groups. This may account for the different chi-test results revealed with each respective Year 11 group and Year 10 2003.

The secondary key informants belonged to Yr 11 2003 and the primary key (Kristen) informant belonged to Yr 11 2002. It was only in 2002 that environmental

committee meetings completely ceased, until that point each form had environmental representatives that played an active part in the school environmental code and acted as intermediaries between the EE coordinator and their peers. Up until 2002, there had been more dialogue between representatives and the EE coordinator (a teacher) and between representatives and their peers, resulting in more dialogue within tutor group situations. The secondary key informants year group had been through two years of limited dialogue, with complete cessation of the committee by their Yr 11. This may have contributed to the difference seen between the two Yr 11 response sets.

The Year 11 2002 cohort had received the most teacher led EE provision, which required individual participation by every pupil in the lessons. The Year 10 2003 cohort had received the next greatest PSHE EE provision, between 2 and 3 hours for each of three years. However, the second year of provision punctuated the other two in being presented by a touring theatre company; pupils had remarked on the lack of participation required by the pupils, that they merely acted as observers of an environmental 'message'. Year 11 2003 had received the least amount of PSHE EE provision, however, this was all teacher led and possibly of a more intimate nature than the theatre production.

The pupils who indicated they do talk to their parents and/or friends about environmental issues may well give a good indication of the number of pupils who do carry out behaviours that could be considered to be environmentally responsible (Ballantyne et al 2001). With *'don't know'* responses remaining similar in all year groups [Q22: M=15.41, SD=2.22; Q23: M=13.04, SD=3.39], the proportions of the year groups that indicated they did talk with family and friends about environmental issues was greatest with Yr 8 2001 and Yr 11 2002.

5.3.2.9 Significance of pet ownership

Independent t-tests were carried out on each year group to explore the difference between the mean total environmental 'attitude' score of pupils who reported having their own pet compared to those who reported they did not. Cases were removed from the calculation if they had missing values for this question. The proportion of pupils who did not report having a pet of their own remained fairly stable from year group to the next (Table 28).

Table 28 – Cohort pet ownership

Year group	Proportion of sample that reported <u>not</u> having a pet of their own (%)
Year 8 2001	19.5
Year 8 2002	18.4
Year 8 2003	22
Year 9 2002	17.3
Year 9 2003	22.7
Year 10 2003	18.1
Year 11 2002	28.1
Year 11 2003	24.8

Single cohort in successive year groups

In all but one case (Year 8 2002) the mean 'attitude' score for pet-owners was lower than that for non pet-owners; three of the cases were calculated to be statistically significant - Year 8 2001, Year 9 2002 and Year 10 2003. This is, in fact, the same cohort moving through successive academic years. The fact that a single cohort has shown similar proportions of self-reported pet owners and a consistently significant difference in mean 'attitude'scores[27] contributes to the reliability of the responses given by the cohort.

This cohort of pupils had the lowest mean total score (i.e. most environmentally favourable 'attitude' responses) of all the Year 8's studied, they had a lower mean total

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[27] Year 8 2001 t=-2.218, df=172, p=0.028 $eta^2 = 0.03$ >small effect
Year 9 2002 t=-2.748, df=166, p=0.007 $eta^2 = 0.04$ >small effect
Year 10 2003 t=-2.026, df=169, p=0.044 $eta^2 = 0.02$ >small effect

score in Year 9 (2002) than the other Year 9 (2003) group studied and in 2003 they had a lower mean total score than the Year 11 cohort.

This response by pupils reporting to own a pet is consistently high for this cohort and suggests a greater sensitivity to/for environment, and all that this term encompasses, than that expressed by pupils without this non-human relationship; similar results have been found elsewhere (Prelle and Solomon, 1996). Pupils that are able to, and have, formed relationships with non-human organisms, to which they demonstrate an ethic of care, may be more likely to extend this towards the environment in its wider sense. Eagles and Muffitt (1990) refer to the greater naturalistic tendencies in pet-owning youths (see section 3.2).

5.3.2.10 Significance of abode

A one-way, between-groups, analysis of variance was conducted on each year group to explore the impact of place of abode on the total 'environmental attitude' scores. Individuals were divided into a maximum of four groups according to the their response to question 4 (group 1: in the countryside; Group 2: on the edge of a town; Group 3: in a town; Group 4: unclear response). There was a statistically significant difference at the $p<0.05$ level in Year 10 2003 only [$F(2,167)=3.17$, $p=0.044$]. The actual difference in mean scores between the groups was quite small. The effect size, calculated using eta squared, was 0.04. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for Group 1 ($M=79.03$, $SD=11.24$) was significantly different from Group 3 ($M=73.19$, $SD=10.88$). Group 2 ($M=75.40$, $SD=11.70$) did not differ significantly from either Group 1 or Group 3. Although Iozzi (1989) referred to research that suggested '... *rural students were more perceptive about environmental issues than urban students* ...' (p7), this particular aspect of this study provides insufficient evidence to support any real

difference in environmental attitudes (evaluative perceptions) between pupils living in rural and urban residences.

5.3.2.11 Factor analysis of questionnaire responses

I decided to explore the data for any relationships in the *approaches* year groups took in responding to the questionnaire. Exploratory factor analysis allows reduction of the data so that underlying trends become more easily discernable. Factor analysis was chosen as a means of reflecting the variations in value- and belief-systems within the year groups and, consequently, it is not expected that similar factor loadings will apply between groups, that is from one year to another (La Trobe and Acott, 2000). However, it will be useful when looking at changes in factor loading within a cohort over time.

Multidimensional scaling is a way of analysing the judgements of similarity between the wide variety of variables that make up the 'multi-dimensional concepts' – the *stories* that are the individuals who answered the questionnaire, and to give an indication of a small set of dimensions that could provide a best fit (Cohen and Manion, 1994). It has been chosen for use in this thesis as it is evident that a small, clear, set of basic factors does not exist in the complex array of variables involved in the decision-making processes of the pupils filling in the questionnaires.

To try and determine a smaller number of factors in the larger set the questionnaire has presented, factor analysis, using the SPSS software package (SPSS, 1999) has been performed. The number of initial variables is large due to the nature of the statements used in the questionnaire, allowing individuals to express themselves in the form of their values and beliefs. By extracting source variables that can be seen as accounting for interrelatedness observed in the data, factors can be identified from variables that correlate highly to each other (Reber, 1995). Correlation matrices were produced that indicated the correlation coefficients (degree of agreement) between statements.

From these initial 'raw data' matrices, sets of questions were focussed on that yielded correlation values of 0.3 or greater. This was done to provide clarity to the data collected, allowing factor analysis to be performed more effectively. The factor analysis on these simplified matrices improved yet further the comprehensibility of the data. The number of components extracted were done so using Kaiser's criterion. The total number of components analysed was determined by the value of their individual contribution to the total percentage variance in conjunction with the use of 'scree plots' (which indicated sudden changes in contribution by variables). The factor is

> *'... a construct operationally defined by its factor loadings.'*
>
> (Royce, 1963 in Kline, 1994)

Loading boundaries that have been used in this study are as follows (adapted from Kline, 1994):

- Loadings **above 0.6** are regarded as very high
- Loadings **above 0.5** are regarded as high
- Loadings **above 0.35** are regarded as moderately high
- Loadings **below 0.35** are ignored

This type of factor analysis is exploratory, as opposed to confirmatory. A wide variety of statements have been used in the questionnaire in order that a number of variables have been covered, a condition necessary for factor emergence. As previously stated, the questionnaire instrument was developed using information from informal and more formal, semi-structured interviewing of pupils in the case study school in addition to free-writing exercises. The factors that emerge will, by the very nature of factor analysis, be affected by the samples from which the data is taken. Kline (1994) discusses the arguments based on sampling subjects.

The different year groups can be treated as different sampling sets, as it can be considered, on one level, they have been exposed to different educational environments to

each other. Correlations become quite reliable when the sample size is 100 or more (Kline 1993), as is the case with this study. The large sample size reduces the effect of extreme scores from individuals that could affect the size of the correlation. The level of significance used is 5%. This is arbitrary, however, it avoids, to an acceptable level, assigning a meaningful interpretation to a statistical error. The difficulty with using different year groups is that the complex factors that are involved in decision-making by the pupils will result in the absence of replication of correlation with these samples.

Principle component analysis (PCA) is the method employed in this analysis as this is seen as the best approach in analysing a large pool of data that can be viewed as a preliminary to development of a new scale (Merenda, 1997). This method has an artefact that a general factor is produced followed by a series of bipolar factors. Kline (1994) considers the interpretation of these components dubious. Rotation is necessary so that factors can be interpreted and identified. Variance remains unchanged throughout rotation. Rotating the factors changes the factor loadings and the meaning of the factors; however, the same amount of variance is explained. There are a virtually infinite number of solutions, one is chosen from this possible range; the solution being a factor matrix where the factors, each, have a small number of high loadings. In this research, VARIMAX, an orthogonal rotation has been used[28]. Using this rotation simple structure was achieved and it is considered:

> *'..where this is possible it is generally agreed that Varimax is the most efficient procedure.'*
>
> *(p68, Kline, 1994)*

[28] The rotated loadings are presented in this study

Two statistical measures were generated by SPSS (1999) to help in deciding whether factor analysis was indeed suitable for the data collected:

- Bartlett's test of sphericity
- Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy

In order for factor analysis to been seen as appropriate for the data in question, the correlation matrix produced should provide evidence of coefficients greater than 0.3. In addition to this, Bartlett's test of sphericity should produce a significance value of $p<0.05$ and a KMO value of 0.6 or above is required for a good factor analysis (Pallant, 2001). The values calculated support the use of factor analysis in this case study.

Factor analysis was performed on the questionnaires completed by pupils within year group sets, in order to explore the factors that were involved in the variance of answers seen within each year group. The components extracted from the data should provide an indication of how pupils are dealing with environmentally related decision-making tasks. However, because the items making up the factors were derived from preliminary data it may be that not all facets of the construct are shown; constructs to the extent that they are helping to make sense of the approach, the decision-making process that pupils are using when thinking about environment and environmental issues.

In each analysis an inspection was made of the scree plot (Merenda, 1997) in order to determine a clear break in the components; the components prior to the break were kept for further investigation. Varimax rotation was performed; the rotated solutions are presented in Appendix IX.

5.3.2.12 Factor analysis – Year 8 2001

This analysis suggests there are two 'traits' expressed by the pupils in this year group in approaching the questionnaire. The first, and the one that accounts for slightly more of the variance of the group, incorporates their knowledge and understanding about

the environment and environmental issues (including actions associated with amelioration) and their environmental sensitivity. The second trait that emerges from the responses is one that incorporates beliefs about actions and, consequently, an individual's intention to act. Both factors loaded with 'locus of control', however, the emphasis in factor one was that of a *shared*, even *externalised* locus, whilst the emphasis in factor two was to an *internal* locus. Factor two loadings incorporated personal actions, preferences and priorities with the pupil's time. In contrast, factor one loadings did not require pupils to reflect on their own lives.

5.3.2.13 Factor analysis – Year 8 2002

This analysis suggests there are two main traits expressed by the pupils in this class in approaching the questionnaire statements. The first is characterised by statements about action; statements that loaded highly on this factor contained references to time considerations, and locus of control (possibly being used to evaluate the potential success of application of time to environmental activities). The second component, which accounted for a similar amount of group variance, as with Year 8 2001, incorporates their knowledge and understanding about the environment and environmental issues (including actions associated with amelioration), however environmental sensitivity was distributed between both factors rather than being located in this second factor only.

5.3.2.14 Factor analysis – Year 8 2003

Most of the statements separate out into the three components; however, there are crossovers, with six statements loading on two components (although greater loading occurs on one). The first factor incorporates, primarily, loadings of environmental sensitivity and beliefs about action linked to action effectiveness. The second factor incorporates, primarily, knowledge and understanding of environment and environmental

issues; whilst the third factor loads highly with statements that relate to more personal reflection by the pupil and evaluation of the effectiveness of youth voice.

Even though there are three components extracted here, they have a great deal in common with the two components extracted with Year 8 2001.

5.3.2.15 Factor analysis – Year 9 2002

Only two statements load on both components, however, they load more highly on one than the other. The statements loading most highly on the first component include those indicating knowledge and understanding of environmental issues alongside environmental sensitivity. Component 1 is very heavily loaded by knowledge-based items. The second component is characterised by attitudes towards action and reference to intention to act. The loading of locus of control on both components suggests that it permeates the questioning approach taken by the pupils, much like it had for this same cohort a year ago (Year 8 2001), whilst the other two year 8 cohorts suggested clustering of locus of control with the component heavily loaded with statements relating to attitude towards action. The loading on the two components is very similar to that of the analysis results from this cohort in the previous year. Two statements have shifted from component 2 to component 1 in degree of loading; these are in relation to vocalisation of concern to family and friends. This close correlation to the analysis performed on the same cohort a year earlier suggests reliability in the components being extracted from the data.

5.3.2.16 Factor analysis – Year 9 2003

In this year group, all but one of the statements, loading highly, separated out onto one component only. The contribution of these two components to the variance in the data is very similar. Statements loading highly on component 1 involve attitudes to action along with locus of control. Locus of control also appears in the second component, however, this is placed with an emphasis towards knowledge and understanding of environmental issues and pupils' environmental sensitivity. The high loading statements on component 1 include the aspect of time as has been seen in previous analyses.

5.3.2.17 Factor analysis – Year 10 2003

The statements loading highly on component 1 have remained similar with this cohort to those that were revealed from analysis of their responses in the previous year (Year 9 2002). Component 1 is composed of statements that refer to knowledge and understanding of environmental issues and pupils' environmental sensitivity. The loading of vocalisation of concern to family and friends has moved back towards the second component that includes attitudes towards action (as it had been in their Year 8 data). For the first time the statement that identifies concern for one's own potential offspring appears as a moderately high loading variable accounting for some of the variance. This loads highly along with other statements of environmental concern. This suggests that the concerns that could potentially be generated are *further* or *deeper* concerns, not spontaneous concern or sensitivity towards the environment and its fate (as this already exists). The second component in contrast is loaded highly with factors that are linked to the priorities pupils have when considering 'time-consuming' action.

5.3.2.18 Factor analysis – Year 11 2002

The first component is heavily loaded by factors that involving knowledge and understanding of environmental issues linked to locus of control. The second component is defined more by attitudes toward action and intent to action, and reference to one's own children appears again. There is some cross over between components with a number of statements, although the loading is higher on one component. This suggests that the social aspect of the individual's life is pervading *overall* approach to the questionnaire and is not restricted to a single facet of the approach i.e. a single component. This may indicate that at this stage the questionnaire is becoming less useful in separating out the approaches these pupils are using in their environmental thinking compared to its use with younger pupils. The increasing importance and complexity of interpersonal relationships that the key informants spoke of in interviews may be exhibiting itself here.

5.3.2.19 Factor analysis – Year 11 2003

Component 1 is composed of factors that involve attitudes to action based upon knowledge and understanding of environmental issues and locus of control. Associated with these loadings is a moderately high, *negative* loading for a knowledge based statement about natural resources running out in the pupils' lifetime (Q20). This suggests that as agreement that they are ineffective in action and don't have time *increases*, their agreement that natural resources will run out in their lifetime *decreases.* That is to say variables that lack reference to personal commitment to environmental issues go hand in hand with a belief that environmental issues are exaggerated (Q34, high loading) and that natural resources will last at least the life of the pupil. The second component is characterised by very high loadings with variables that suggest attitude formation based on knowledge and understanding of issues influenced by personal investment and environmental sensitivity. However the dichotomy in the factors that load between these two components is not as

clear as with the Year 8 to 10 questionnaires. Again, as with Year 11 2002, the personal aspects of the individual are showing importance across the approaches taken to the questionnaire, with references to prioritisation of time in both.

In all the groups, the components extracted from the data account for over a third of the variance seen in the data of that group. All other components extracted, individually, contributed very small amounts to the variance. Although this means that almost twice as much variance is unexplained as is explained, as unexplained variance contains unreliability and random errors (Merenda, 1997), this is being considered an acceptable proportion for explained variance in this instance. The factors extracted and rotated are in no way being heralded as the complete description of environmental attitude, however they can be used in a heuristic approach (Darlington, 1997) to understanding the main features being expressed by the pupils in marking the questionnaire statements. The characteristics describing the components in each analysis are valid for the particular group in the analysis. Each group approaches the questionnaire in a unique way that is extremely complex, but data reduction allows some sense to be made of their approach.

5.3.2.20 Statement 36 – A final word

The factor analyses carried out only revealed a single year group whose variance was contributed to by statement 36. This masks that fact that, although the distribution of responses to this statement (based on the reduction to *agree, don't know, disagree*) remained relatively even across all year groups, more than 55% of the year in every case expressed agreement with the statement (table 29). This agreement indicates an unfavourable aspect of *environmental attitude*. This is hardly the desired outcome from pupils progressing through an educational system that purports to teach and encourage citizenship from their pupils. Although this evidence cannot distinguish between

individuals who have changed from one year to the next, it is suggested here that educational provision is not impacting significantly on pupils' perception of place in society. This supports feelings of external locus of control and lack of empowerment expressed during pupil interviews.

Table 29 – Statement 36 responses indicating Adult-Youth relationships

		Response to Statement 36 (individuals)			Total
		favourable	Don't know	unfavourable	
Year Group	8. 2001	24	33	117	174
	8. 2002	23	29	100	152
	8. 2003	22	36	108	166
	9. 2002	19	27	124	170
	9. 2003	25	36	91	152
	10. 2003	20	36	115	171
	11. 2002	24	27	66	117
	11. 2003	19	38	77	134
Total		176	262	798	1236

Pearson chi square = 17.82 (df = 14) p=0.22

5.4 Peripheral Interviews

Further interviews with pupils, other than individuals involved with BioSoc, were undertaken to provide greater depth to the case study 'narrative'. These interviews I refer to as 'peripheral'.

5.4.1 Identification of peripheral interviewees

During 2001 and 2002, further change was made to the EE provision at the case study school (Chapter 2). The Interactive Theatre production for Year 9 pupils ran once in 2001, I was unable to observe this activity due to teaching commitments. However, informal feedback from the pupils indicated that it was a more visually stimulating presentation of material they had already researched during their autumn term for a rainforest project carried out in geography lessons.

Year 8 and Year 10 pupils received the same 2-lesson provision for EE. A local marine, wildlife charity, actively involved in wildlife pollution incidences, came to the school in the spring term of 2002. They presented two assemblies, one for lower school (Years 8, 9 and 10) and one for upper school (Years 11,12 and 13) pupils. Each assembly was taken by 3 members of their staff and was supported by slides of oil spill disasters and wildlife rescue work. The same group returned to school on 4 further occasions in the summer term, holding 2 sessions with each of Year 10 and Year 8. In the first session (a single 50 minute lesson) the charity staff spoke to the pupils about their work and described the issues associated with marine pollution. The session ended with the implementation of a research task. Each form was given a 'role' to play, one of the following: local council, environmental pressure group, oil company, local residents or press. The pupils in each form were given a file containing press clippings and fact sheets about oil tanker disasters and wildlife affected. The task was to prepare to attend a press conference in the second session (two weeks later), so they could ask questions and present

a standpoint. The form tutors were asked to provide some tutor time for preparation and pupil access to the fact sheets for further work at home. I was one of the Year 8 tutors involved in the task. Conversations with other tutors revealed that only one or two tutor time periods could be 'given over' to preparation for this task, due to other school commitments. The pupils were split into smaller groups that could focus on sections of the research; however, tutor group collaboration was not possible until the morning of the second session. It appeared, from informal conversations with Year 10 tutors (Year 10 completed the same tasks a few weeks earlier), that these logistical problems were common to both year groups undertaking the task. I interviewed 3 pupils, from my own form (Year 8 during the task), and 2 Year 10 pupils about the two sessions. The pupils were chosen by their peers; being identified as individuals who had actively participated in the task and were willing to talk to me about their experiences (purposive sampling).

Each interview was carried out with the same conditions as described for the key informants interviews (section 5.2.1), again a semi-structured approach to the interviews was used, with guidance questions providing a scaffold for the interview. The Year 8 pupils were interviewed upon immediate return into Year 9 (2002), as the second session was very close to the end of term and it was not possible to carry out interviews any earlier; these pupils will be referred to as Year 8 in the analysis. The Year 10 interviews were held just before the end of the summer term (2002). All EE activities within PSHE stopped at the end of 2002 due to termination of the position of EE coordinator.

In the spirit of action research, in my capacity as a science teacher and tutor, I had been looking at opportunities to make changes in my teaching such that the declining interest and feeling for environment and environmental issues could possibly be reversed or at least halted. I argue that many changes took place in my approach to teaching and, consequently, my teaching environment, over the duration of the research project (and

beyond). Many changes were small, such as more care in the gestures used when a pupil was contributing to discussion, but some were larger and thus able to be located in a time frame. I report here on two such instances with classes of Year 11 pupils. I interviewed one group of four Year 11 pupils in the summer of 2001 and another group of three Year 11 pupils in the summer of 2002.

In the case of the Yr 11 pupils, there were two opportunities for me to make changes in my teaching approach to two topics within the Biology G.C.S.E. syllabus followed by the school. With the first group (2001), during a unit called *Humans Influences on the Environment*, the pupils were encouraged to explore their affective domain as well as develop the cognitive aspect in relation to the, syllabus specified, environmental issues. During a single lesson (February 2001) the pupils watched a video, which was used by the school's Biology department to introduce (or remind) pupils of major environmental concerns (linked directly to human resource consumption activities), before making some notes to aid them in the production of a 'project' presentation of the issues. During the second half of the lesson, pupils and teacher recalled points made on the video; this was done informally whilst the pupils were in their working groups and I circulated amongst the groups. It was during this close quarter discourse that pupils were encouraged to explore how they felt about the issues and not to restrict their discussion to the purely factual, as prescribed by the national curriculum. When the projects were completed, one pupil had presented hers with an opening page that reflected the affective aspect of the discussion work (Figure 19).

This prompted me to follow this up in the next lesson with informal interviews with the pupil identified above and 3 other pupils who were willing to discuss their feelings and be recorded on audiotape. I started the interview by asking the pupils to reflect on EE provision at the case study school; subsequent questions were then triggered by pupils' responses (see section 5.4.1.1)

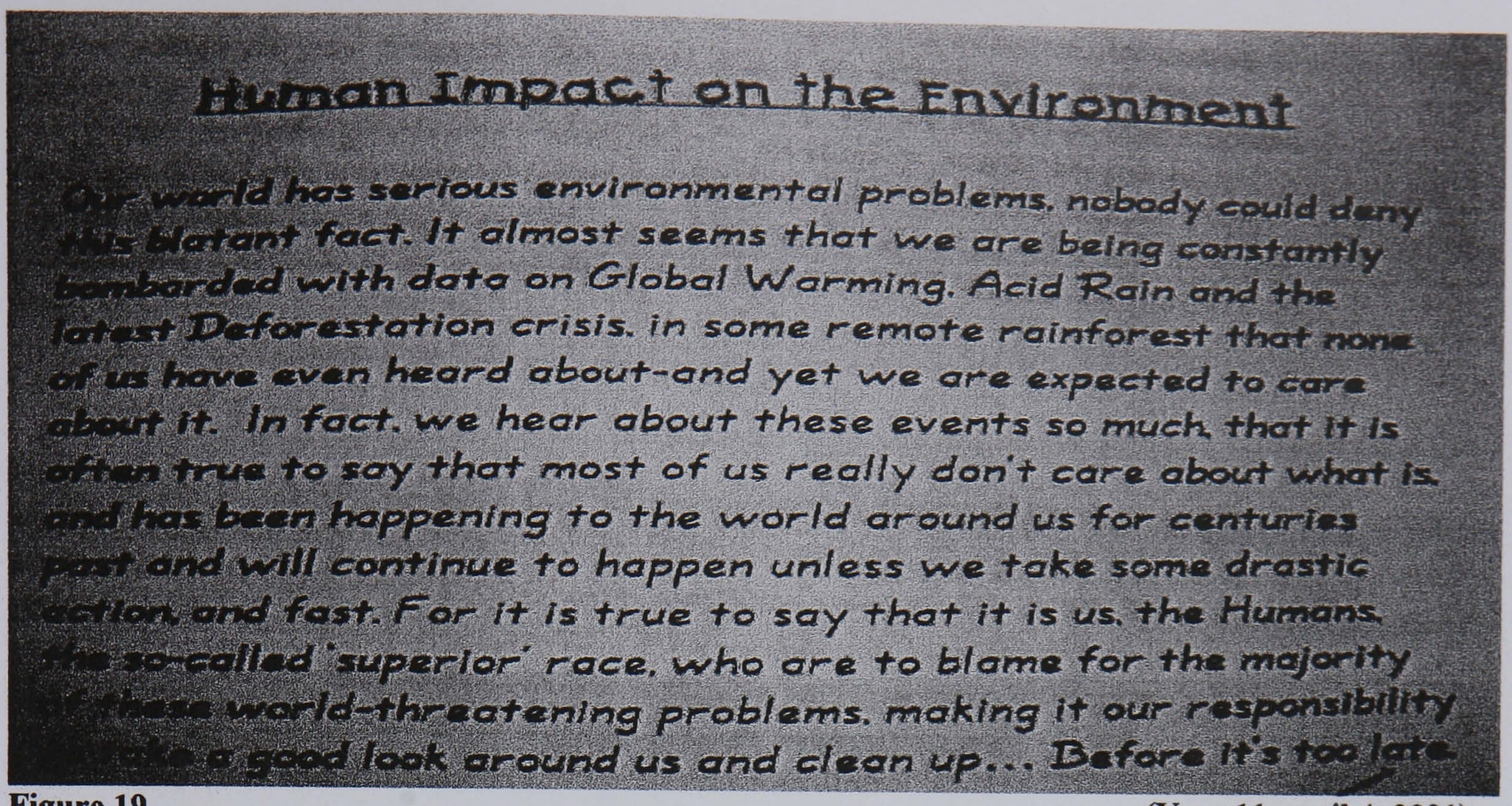


Figure 19 **(Year 11 pupil 4, 2001)**

With the second group of Yr 11 pupils (2002), during a unit on *Farming*, 2 pupils were very vocal about their vegetarianism and their views on farming systems. I presented the pupils with an opportunity to explain their views to the rest of the class and to run a question and answer session. The pupils were nervous at the thought of exposing their opinions to a large group of their peers, many of whom they did not know very well. Nevertheless, they accepted the opportunity, with the proviso that the teacher would not record the lesson. The pupils stood at the front of the room and explained their stance to their peers. They asked moral and behavioural questions of their classmates and in return they were prepared to answer questions. I was present to guide the arguments away from becoming too personal (such as when negative comments were made about a person's character); however, the arguments were allowed to get 'heated' and 'forceful'. The lesson ended with a summary of some of the questions and views that pupils had, resolution was not necessarily achieved for all pupils. Informal, verbal, feedback from the whole group suggested that they had enjoyed the session for a number of reasons - expressing themselves with little restriction, having to think about their arguments and hearing alternative points of view. It was during the following lesson (the next day) that I had an opportunity to talk to pupils on an individual basis (5.4.1.2)

One further instance of change in my teaching approach is reported within the Year 8 EE PSHE interviews; the occasion was the purposively designed EE PSHE session described earlier. The PSHE activity was provided to both Year 8 and Year 10 pupils in the academic year 2001-2. Two Year 10 pupils, from Cohort C, agreed to be interviewed for comparison with the Year 8 pupils' responses. I concentrated on my role as collaborator with the pupils in the generation of information to use in the task that had been set. In acting as collaborator, I responded to the pupils as equal and not as superior; I was open about the limitations of my knowledge and encouraged pupils to generate answers to their own questions. I found the process liberating; I was able to enjoy the process of working with my tutor group as a team and seeing all pupils actively engaged in a task within which they had a degree of autonomy. I found it significant that, due to the session organisation allowing only a small group of pupils to speak, the rest of the class were very disappointed that they would not be provided with an opportunity to express their opinions. Interestingly, a number of individuals who were disappointed were pupils who, in the past, had been happy to remain in the relative shadows of their peers.

5.4.1.1 Year 11 reflections on environment and environmental education – Summer 2001

Two sessions of Year 11 informal interviews took place, one in the summer term of 2001 and one in the summer term of 2002. Both sessions were opportunistic and brought about as a response to the events that had taken place in the lessons with each group. The interviews took place in the case study school science department office, as the classroom that all other interviews had been held in was in use with the classmates of the interviewees. I sat at one end of the office with the interviewee, which was generally empty, occasionally a member of the department would enter for a brief moment and then leave. The two doors into the office were kept shut. I transcribed the interviews and used

N6, qualitative software (QSR, 2002), to extract categories of responses in the transcripts. Descriptive analysis of the transcripts contents is presented in Table 30.

As stated at in section 5.4.1, I did not use a schedule for this set of interviews; the questions emerged as a consequence of responses given by the pupils.

5.4.1.2 Year 11 reflections on environment and environmental education – Summer 2002

I took the opportunity to talk to 2 pupils (pupils B and C) who had vocalised their animal welfare concerns during a series of lessons on farming and to a third pupil, their close friend who was not vegetarian (pupil A). The informal, unstructured interviews, took place under the same conditions of the Year 11 interviews in the previous section. Two of the pupils were happy to be recorded on audiotape, one pupil (C) declined and so the interviewer made notes which were written up more fully later the same day.

The pupils had come to the case study school from different independent schools. Upon completion of Year 11, two of the pupils returned to the independent system. Pupil C remained at the case study school. During the question and answer session run by pupils B and C, it was evident that there was a difference in the degree of empathy felt by these two pupils with their classmates. Pupil C would absolutely not compromise her line of thought; she was intensely angry with individuals who expressed a desire and commitment to eating meat.

Table 30 – Descriptive analyses of Year 11 (2001) interviews

Category	Responses given by pupils within the category			
	Yr 11 Student 1	**Yr 11 Student 2**	**Yr 11 Student 3**	**Yr 11 Student 4**
Environmentally responsible behaviour opportunities in school	• School encourages students to recycle • Provides recycling bins • Signs on doors to keep them shut – heat conservation	• Environmental representatives for each form • Recycling bins around the school	• Bins available in school for recycling purposes	• Environmental representatives for forms
Environmental action in school	• Not as much as there could be • Personally – closes doors for heat conservation • Personally – does not turn off lights or put bottles in the right bin	• Inaction related to style of EE provision	• Minority of students act in a positive way • Personally - try to put rubbish in the right bins	• Personally – have been environment representative for the form one year
Reasons for inaction in school	• Just don't think about it before putting some thing in the bin	• Too much like hard work • Repetitive, uninspiring EE provision	• Because we are supposed to do it, some students react antagonistically (not environment specific) • Some students don't like following rules • Personally – use the correct bins • Students need an incentive and want fun • Ecological disasters don't affect us in the UK	• Lack of motivation • Expensive to act more responsibly

Are environmental issues overrated?	• Yes – large issues are happening over a really large time span	• Unsure – conflicting information	• Effects occur elsewhere, we aren't affected – generates feeling of safety	• They don't seem real, as they're so far away • We have time to be leisurely
Timescale effect	• I won't be around when it happens, it won't affect me • If I knew the time it would happen was closer it would concern me • I don't think about it unless it's affecting me at this time	• The issues are going to affect the future, not the individual now	• Future importance, do not feel that I should be doing anything straight away	• Probably affect my generation onwards, in about 50 years • Because it's so far off, it's not really making an impression on people
Issues that have a sense of urgency	• Deforestation, due to growing time of trees	• Fossil fuel use • Greenhouse effect • More topical than urgent as people aren't giving up their cars	• None – they can wait until I get a little older	• None – everyone thinks someone else is dealing with it
Reflections on personal action	• Wouldn't want to do something like tree hugging! • Does not feel passionate enough to act • I do quite a bit for someone my age	• Can't be bothered to change transport habits, much easier to go by car, especially in bad weather • Action will come about when we realise this cannot carry on, that we are in for a disaster	• Too busy, exam pressures etc • Too much of a burden to set myself to act for the environment • No incentive to act, it's not worth it	• Having facilities close by encourages you to act • Too busy at the moment • Cannot do it on my own, need help to act
Considerations for education	• 'Drumming' things in can lead me to 'switch off' • Likes the time to ponder on knowledge and develop own thoughts	• Repeated material causes me to 'switch off' • Would like to see encouragement of individuals to actively participate • Project research should culminate in action not written work presentation	• Putting knowledge into action is important • Group interaction • Once all the basics are known we need to move on not repeat them • Current EE provision is too repetitive • Advertising, the media	• We need to go beyond being told to recycle to being guided as to what can be recycled and where, so specific and local knowledge is needed • Resources to encourage recycling need to be widely available and then

		• Personal contribution to environmental issues needs to be made more visible to students • School is a good place to provide this education as family contribution will be variable • The Government should be more like role models – affects attitude of the public	would have an effect, at the moment there are lots of animal programmes but not environmental issues programmes	encouraged to be used (no point in giving out recycling boxes if they are too small for the average household or are never collected) • Current EE provision is like a strict set of rules • Setting rules for teenagers will immediately encourage antagonistic behaviour! • Image is crucial – need to move away from hippie, sixties green image to give it more credibility • EE provision needs to acknowledge individuals' desire for a modern, convenient lifestyle
Family environmental behaviour	• Parents' action influence me • Mother instigated the recycling, she did not like the waste of so much material • We recycle newspapers and bottles – simple things	• We recycle and are conscious of energy conservation at home • Father is very interested in environmental matters, involved, actively with conservation work • Father talks to me about environmental issues, would join him on weekends if I had time	• Family is hugely influential in my behaviour • Behaviour I have grown up with is how I look at act • Not much recycling at home, parents are too busy	• Family did do recycling when I was younger as a recycling centre was very close by • Not much recycling now, parents are too busy • Grandmother has never recycled

Continue actions when older?	• I think I will • You get used to the action	• Will probably take confrontation with consequences of issue before being spurred to act	• I will probably recycle waste • I would like to do something more active than just consider environmental behaviour	• Probably, independence from parents means you act out of necessity e.g. cleaning up after yourself
Environmental predictions	• State of the planet is declining • There is still hope, is people act now • If no changes are made to waste disposal, rubbish may be a big problem in 3-4 yrs, this speeds up the time before I am affected	• Planet is at risk from human activities • Small group action is ineffective, needs to be everyone acting • Attitudes need to change from 'one more time won't hurt', greater awareness needs to be translated into action	• There are a number of possibilities, everyone becomes more environmentally friendly, or they turn their backs on it and we become even more industrialised and computerised • Alternatively, technology may hold the answer to issue resolution	• Humans are lazy, can't be bothered • Minority act, majority would rather do something else • Image needs a total overhaul • Humans will not react until they perceive a panic situation • The Government will throw money at it when it is critical • The feeling is, someone else will deal with it • There is hope – still time to realise what is happening and act on it

Pupil B was a little more tempered in her approach to her peers and gave some ground to their reasons for eating meat. Pupil A agreed with the animal welfare issues that her two friends raised during their debate. However, she transferred the responsibility to her parents, more especially her mother, as this was the individual in the family who carried out the food shopping. Pupil A, although concerned about animal welfare in farming, did not feel she would go to extremes to check the source of meat she would buy, even when older. Pupils B and C had taken the decision to become vegetarian based on their concern for animal welfare and had done so in the face of non-vegetarian family members. Pupil B remarked that all her family ate meat, but were accommodating to her needs during mealtimes. Pupil C commented on being joined in vegetarian action by her stepfather, whilst the rest of the family were supportive of her personal action.

Pupil B had turned vegetarian 5 years prior to the interview, she recalled a junior school visit to a local chicken farm. Although, she believed the intention was to encourage the pupils (who all lived in or near farming communities) to develop positive attitudes towards animal farming, she believed that in later years its residual image contributed to her turn to vegetarianism. In her opinion her feeling for environmental issues lay mostly with vegetarianism, however, she pointed out that she felt negatively about the use of cars and tried to use public transport as often as possible. Pupil C had become vegetarian quite recently, in comparison, only 5 months prior to the interview. She recalled talking to Friends of the Earth and Greenpeace representatives in the local large town. Pupil C found their arguments very appealing, although she was conscious of some degree of bias. Her interest lay in the political domain, as she indicated that this might well be a way forward in initiating changes in humans' influences on the environment. Key items from the interview are identified below:

- Family influences –Pupil C, who was the most fervent in her environmental beliefs and lifestyle choice, recalled her mother having some interest in recycling key materials such as cans and bottles. Pupil A described her mother as an '*eco-warrior*' in her drive to recycle waste materials at home. She felt that she had always had an ethic of care for the environment and followed this up with behaviours such as recycling materials at home and putting bread out for garden birds. Pupil A described her mother's actions as instilling good intentions in her but this was not necessarily carried through to overt behaviour. Pupil B remarked that her mother was an influence for environmentally responsible behaviour at home; the family had a compost heap and collected waste packing for recycling. She conceded that she did not always involve herself in the latter; Pupil B asserted her opinion that:

***Pupil B**: I don't think people can be bothered 'cause it's really, really difficult to find somewhere to go to recycle things*
***Interviewer**: So it' more, it is an, an effort to do it?*
***Pupil B**: Yes it is, it's really hard and I don't think people can really be bothered really, I think that people think that you should but they don't because it doesn't really affect them now.*

- Topics of conversation with friends – Pupil A remarked that the only times that environmental issues, vegetarianism and animal welfare became topics of conversation would be when Pupils B and C were present. She did not feel that these were topics that Year 11 pupils would discuss more spontaneously. Pupil A explained that free time in school (lunch times and break times) were important for social discussions – '... *gossip* ... '. Pupil C remarked on the positive nature of the discussion experience with her peers in the science lesson. She opined that many of her peers were very naive about animal welfare issues in farming (***limitations in cognitive domain***) and had not explored their feelings towards aspects of food sourcing and processing (***limitations in the affective-evaluative domain***). She described her identity as not the 'norm' for

individuals of her age group; in her opinion most of her peers were interested in fashion, shopping and famous footballers. Pupil B confirmed that she was aware of only Pupil C as showing interest in environmental issues, she suggested that peer interests lay in other areas, such as socialising. She referred to individuals showing a lack of being '*..bothered..*', suggesting that there was ***emotional absence in the cognitive aspect of environmental issues***. Student B echoed student C's impression of peer naivety regarding animal welfare issues.

- Outlook for the planet – Pupil A was very positive about the future. She believed that many individuals were now working to improve environmental conditions and deal with environmental issues. Her belief had developed from information brought to her from her mother. Her mother was involved in visiting schools and 'spreading the word about actions such as recycling' (Pupil A was unable to elaborate any more on her mother's role). The information Pupil A received indicated that individuals involved in environmental action were mostly from an older generation. Pupil C asserted a degree of optimism about the future; she felt that individuals were increasingly aware of their effects on the environment and many were willing to rectify the situation. Pupil C was firm in her belief that politics was an effective route to human behaviour change. Pupil B suggested that the temporal focus of her peers was restricted to careers and that they were not concerned with looking beyond that time scale. She expressed faith in the ability of people to change if they are continually pressured to do so and, consequently, held a positive outlook for the future of the planet.

- Environmental activists/leaders – Pupil A reasoned that individuals such as *Swampy*[29] were needed to be figureheads for action. She made the deduction that the presence of

[29] well known British eco-warrior character

these types of individuals indicated the involvement of many others in similar campaigns. She argued that figureheads were important to provide a focus to environmental action:

***Pupil A**: I think so Yeh, 'cause otherwise you will get a bit lost with people all having their own ideas*
***Interviewer**: Really, they need someone to follow, to show the way?*
***Pupil A**: Well, yes to give them sort of, directions.*

Pupil C expressed an intense keenness to involve herself in more radical actions such as chaining herself to trees and 'visiting' nuclear sites. She deemed actions by some environmental charity groups as 'too soft'.

- <u>Code of environmental behaviour</u> – When pressed about her reference to the need for environmental figureheads, pupil A commented that she did not think people were being requested to behave in particular ways:

***Pupil A**: I don't think anyone has been told how to*

***Pupil A**: no I don't think anyone feels under pressure*

***Pupil A**: I think you've got an option in the back of your mind and I think most people will choose what is the right thing to do, in the end.*

Pupil C expressed anger towards the media presentation of environmental issues. She felt that trivial stories had precedence over environmental stories and that the latter were invariably presented as *faits accomplis.* In addition to this, she asserted her annoyance over the anthropocentric nature of reports, with all reference to effects on other living organisms seemingly unimportant. When pressed about the difference between her and her peers, Pupil C articulated that she had always had a great deal of

environmental sensitivity (using words such as *feeling for* and *care*) and she felt that her peers had not developed their capacity for it to the same degree.

5.4.1.3 Year 10 and Year 8 reflections on externally led environmental education provision

Here pupils were asked to reflect on the content of the two sessions that were provided by a visiting environmental charity group. My first question simply asked them to explore what memory they had of the visits. Two of the Year 8 pupils and one Year 10 pupil recalled the focus of the first session being about oil spills and how the environmental group rescued animals from such disasters. Another Year 10 pupil reflected on how the group had explained who they were and that they had insufficient equipment to deal with many marine disasters. One Year 8 pupil could only recall that they had been given a task to do by the group, she needed prompting to remember the focus of the material being explore with them:

***Pupil c**: They handed out the packs and things.*
***Interviewer**: So nothing stuck with you, no particular bits of information about Seatown, or about them?*
***Pupil c**: About the harbour being important.*

When the pupils were asked to elaborate on aspects of the sessions that they enjoyed, six main factors emerged:

- <u>Age of the speakers/Age appropriateness</u> – One Year 8 pupil commented on the fact that the speakers were younger than most teachers and this was more appropriate and conducive to pupil engagement. Older speakers would have been acceptable if their actions were still young and enthusiastic.

- Pupil engagement – One Year 8 pupil and both Year 10 pupils remarked on the interest value of the talk as the speakers were relating actions in which they had actually been involved. A Year 8 pupil thought that interest was affected by a lack of visual support, such as slides. Use of audio-visual material might have helped add realism and immediacy to their presentation; lack of capitalisation on this powerful effect (Ballantyne *et al*, 2001) was evident in pupil responses.

- Talked about action – Linked to the second point, one Year 8 pupil commented on her interest in the fact that the speakers related how they were ***active participants*** in wildlife protection and conservation. A second Year 8 pupil referred to the positive impression that was conveyed about the possibilities for youth action, and the passing on of skills information – where to go if one wishes to act. One of the Year 10 pupils remembered that one of the speakers had commented on having her mobile telephone with her and that she might have been called away at any minute during the talk.

- Talk 'style' – Linked to the first point, one Year 8 pupil commented on the enthusiastic nature of the speakers. One Year 10 pupil referred to intricate detail (on litter contribution to wildlife injuries) given in the talk, whilst the second Year 10 commented on the deeper impression made by the 'live' talk rather than presentation in video format.

- External speakers – One Year 8 and one Year 10 pupil made, unprovoked, comments on the positive nature of having external speakers come to the school in this instance:

***Pupil l**: It was okay. But they had but I think it was better having somebody coming in rather than just teachers doing it.*

***Interviewer**: Oh? and why's that?*

***Pupil l**: I think it gave more meaning to it, because [our form tutor] had just been there reading and stuff.*

***Interviewer**: But if teachers were as animated do you still think perhaps it wouldn't have had as much impact?*

***Pupil l**: No, I don't think so. because if you've got somebody who specifically does it as a job,*

***Pupil l**: saying, this is the problem, then I think it is more like, real.*

(Yr 10 pupil)

The legitimacy of the educator had been raised in two other instances. Alison had referred to lack of behavioural example set by her teachers. This inaction or negative action is in conflict with EE and, consequently, she used this as a reason for personal inaction or negative action; she lacked visible reinforcing behaviours (Tung *et al*, 2002). An extract from the author's 'observation diary' supports the suggestions that teacher behaviour is highly influential in the credibility of EE practice:

May 2001 – PSHE lesson with Yr 9 – Smoking and similar health issues
One pupil became very vocal about the health and social education she had received over the years, she complained that, often, certain teachers are given the responsibility of presenting PSHE material like 'anti' smoking and yet they, themselves, smoke. She described this as hypocritical and only leading pupils to reject the education. Her friends agreed strongly. The same pupil commented on the fact that:

A [subject] teacher is there, trying to tell us that we should look after the environment and not pollute and there [teacher] is smoking like a chimney, [teacher] stinks of it, so [teacher] polluting the environment all the time. Of course we're not going to take any notice of what [teacher] says, you just think 'Oh yeah, but you don't! - I pick up litter but that's because I want to do it anyway, it's got nothing to do with what [teacher] says'.

- Learning Style – two of the Year 8 pupils and both Year 10 pupils made references to activities and ways in which they recognised they enjoyed the learning process:
    - **Accessing autonomy**
    - **Group discussion/Talking**
    - **Lack of writing/withdrawing the need for 'hard copies'**

The Year 8 pupils talked about the positive nature of talking over the task in small groups, that most pupils would get an opportunity to contribute and that individuals were forced to really think about what they said before they spoke, as there were no prescriptive responses being sought. One of the Year 8 pupils, who had described this benefit, also explained how the lack of interference by the staff and the placing of responsibility for preparation on the pupils themselves had allowed the pupils to access a more personal and thorough understanding of the material. The removal of compulsory writing as part of the task had been applauded by the pupils, not for being easier, but for allowing more time for discussion and autonomy during task preparation.

The successful use of discussion within peer groups, leading to self-generated knowledge and critical evaluation of information provided, is not confined to female students (Solomon and Harrison, 1991). There is evidence to show that young pupils (age 9 and 10), who are used to this student-centred approach in teaching, are capable of developing their own environmentally responsible code of conduct and acting on it (Jimenez and Lopez, 2001).

However, these positive attributes were tempered by the dislikes the pupils referred to during the interviews. The first criticism came from the Year 8 pupils, who commented on the limitations of the talking and discussion activities. They were critical of the size of group that had been placed together in the first session. This had been the whole year group, approximately 180 girls. The criticism stemmed from the fact that the visiting staff talked for the majority of the 50-minute session and did so to the

whole group, gathered together in one hall. This talking had been directed at the pupils with very little opportunity for interaction. During the Year 8 session, the author had been witness to the lack of engagement of pupils due to the nature of the session being in direct conflict with the positive qualities the pupils had referred to about discussion work above. Time, or rather lack of it, had been an issue with both year groups. However, it was one of the Year 10 pupils who, in contrast to the Year 8 pupils, commented on the research task as inappropriate for her age group, that lengthy research tasks that were not part of compulsory education had little priority with the pupils and therefore received less attention and commitment.

The activity provided to both year groups was identical in design, the differences existing in progress and outcome. The Year 8 pupils had responded much more positively than the Year 10 pupils, one Year 10 pupil identified as an active participant in the task had declined to come for interview as she felt she didn't *'have anything good to say about it'.*

Evidence from other studies (Ballantyne et al, 2001) has identified the fact that EE activities do not transfer well between age groups. This is supported by research that suggests a change in students' interest in biology, and science generally, as they move from early to late secondary school age (in Lindemann-Matthies, 2002). There are many different relationships held by humans and the rest of nature, not one. There are many different environmental issues, not one. There are many different ways of looking at these issues, not one. Because of this. *'... multiplicity of stories... we should be looking at a multiplicity of strategies for policies, pedagogies and research in environmental education.'* (p154 Gough, 1999a).

The Year 8 pupils were asked whether they thought the activity was worth repeating, all three agreed. One pupil commented on the need for greater frequency of such activities so as to *'... keep it in mind... '*. The help provided by the visiting staff was seen as *superior* to that given by the teachers, as the tasks and

materials were seen to be their expertise. Another suggestion for improvement was to reduce the group size in the second session so that more individuals would be involved in the press conference activity and, consequently, be expected to feedback on their thoughts. This had been a criticism levelled at the second session, by one of the Year 10 pupils, in relation to lack of access for pupils.

The duration of impact of the experience was quite short for some of the pupils. None of the Year 8 pupils felt that they talked about the day or the related environmental issues, post-activity; one pupil had forgotten most of the details of the day (she had referred to the need for more frequent activities), one pupil commented on not acting, but potentially considering action and the third pupil said that she didn't know if action was actually feasible but it had certainly increased awareness in relation to action.

It is naïve to think that a single field trip or visit, or an isolated environmental 'unit' (Heller, 1997) will be sufficient to permanently change the affective in children such that they are more likely to perform environmentally responsible behaviour much into the future, indeed this has been shown not to be the case (Knapp and Poff, 2001).

One of the Year 10 pupils had visited the environmental charity group's ship a few years previously (not with the case study school) and she described some of the details of that visit to the interviewer. This pupil felt that she had remembered more from her visit to the ship than she had done from the more recent sessions at school. The activity had exposed the complex nature of environmental issues, rights and responsibilities:

A: *Well I think it's anyone because the council have got all their rules so they can't help with it they don't help with it because they have all their rules about fault and everything, and the oil companies ought to, ought to plan their routes better ought to have safer tankers and then, um, there's people, like the driver have got to be really aware so that they don't crash. And then there's all the environment groups and they have got to help clear it up and so, and then if they spend ages like, arguing about it then it is kind of their fault too because it's been, it's got worse while they're talking about it.*

(Year 8)

Having watched an assembly presentation (April 2002) by the same local based, national wildlife rescue group, many pupils reported to the case study school EE coordinator[30] that they wished to help out on beach clean sessions. I asked my own form and one other (both Year 8) to write how they felt about the assembly, so that feedback could be given to the EE coordinator. Although all responses were positive, with pupils writing of their enjoyment of the assembly presentation, some pupils reported that they were not certain whether they were going to do something about what they had seen and been invited to become involved in. A diary entry noted:

April 26th 2002 *- Indecision apparent in their written reports on the assembly - as in the verbal evidence in interview sessions with individual pupils when asked about action they could take in response to environmental problems*

[30] pers.comm. EE coordinator 25/04/02

5.5 Educator reflections on Environmental Education in the Case study school

During the course of the research, I was able to carry out more lengthy discussions with a small group of educators in the school. The semi-structured interviews were intended to allow me to explore, in a generally informal atmosphere, the perception of EE by the educator and how their attitude towards it may be reflected in the pupils' responses in the study. Some of the comments made in interview are quite personal in nature, or refer to aspects of individuals that the interviewee did not want reproduced out of the interview. As a member of the staff at this school, I have to respect the privacy of individuals and, consequently, there are restrictions on the use of material from these interviews.

5.5.1 Permanent members of the teaching staff

The first of these interviews came about following informal conversations that I had with the Head of Year 9, in relation to the PSHE provision and more specifically the EE 2-lesson programme she had experienced with a Year 11 tutor group. The unstructured interview took place 4th February 1999, in the Head of Year office. We were both members of the same department; being comfortable in each others company, the atmosphere was very friendly and quite relaxed (although the presence of the tape recorder did alter that slightly from the norm). The questions or statements used in this interview were intended to encourage the interviewee to explore her attitudes towards EE and the materials she had used in her lessons with the tutor group.

The Head teacher was interviewed on 29th February 1999. The interview was semi-structured (the interviewee had requested to see the questions beforehand) with the intention to explore the Head teacher's attitudes towards EE and its provision at the case study school. It emerged, when reviewing the transcript for this interview, that the

interview had been turned on its head in the second half, with the interviewer answering questions in relation to her department and a specific role the Head teacher wanted her to fulfil.

In the spring of that year (19th May 1999), I interviewed the EE coordinator. This interview was semi-structured, in that there were outline questions to ask the interviewee, however, the direction of the interview was dictated, to a large extent, by the interviewee's responses. The interviewee had been given a copy of the schedule beforehand.

The Head teacher left the school 12 months after her interview, and the position was then filled in the spring of 2001. Just over a year later the 'new' Head teacher agreed to be interviewed. She did not request questions prior to the interview and, although the semi-structured approach was intended, this interview flowed like a more informal conversation.

Each interview was transcribed by myself, and N6, qualitative software (QSR, 2002) was used to aid category extraction from responses. Statistical analysis is not appropriate for these 4 interviews, what follows is descriptive analysis of the content of the interviews.

The responses given by the teachers interviewed fell into 9 main categories. A summary of individual responses within categories is presented in Table 31.

Table 31 – Descriptive analyses of Educator interviews

Category	Responses given by teachers within the category			
	Head teacher 1 (29/03/99) age – mid 40's *	**Head of Yr 9 (04/03/99) age – mid 30's***	**EE Coordinator (19/05/99) age – early 30's***	**Head teacher 2 (05/12/02) age – early 50's***
Style of EE provision in school	• Material satisfactory for any teacher to use • Staff not expected to know a lot prior to lesson • Teachers are facilitators	• Provision is too similar to Geography • Complicated sheets given to staff and students • Too much material to get through in the lesson • Hard work!	• Should be pupil centred • Teacher is facilitator • Materials written 'in-house' • Written materials include art work • Staff instruction sheets provided • Use of assemblies in addition to PSHE lessons	• Only counted for a couple of PSHE lessons • Covered in Science and Geography
Personal approach to EE	• Followed instructions provided	• Happy to improvise EE lesson if guidance is deemed inappropriate • Use of local press cuttings about Env. issues • Explore where pupils stand on issues irrelevant to them	• Questions the effectiveness of methods such as recycling • Actions such as recycling are good for pupil involvement • Personally produces all EE materials • Uses own interests to direct focus of materials	• No hands on experience in this school • Believes in raising awareness, through opportunities such as assemblies • Science and Geography highly involved
Responses from pupils during EE	• Pupils are interested in things that affect them individually • Pupils are not so interested in helping a wider audience	• Overload of information • Much information is not immediately life relevant to students – lacks connection	• Students need constant reminding to recycle materials • Yr 13 enjoyed their EE	• Younger pupils enjoy activities such as pond work, it loses something for the older pupils

* Caucasian female

		• Students feel depressed about situation and Disempowered • Selfish reasons for not acting more env. responsibly • Students question the reasons for doing EE lessons	lessons (personal experience) • Students seem keen until they are faced with having to act e.g. empty a bin • Lack of commitment by students to their own requests – costly • Some topics are very repetitive for the students e.g. recycling	
EE training for teachers	• EE lessons are not very difficult to take, all information is provided and students build on that	• Training is needed • Offered EE training at one point but it was to be in own time (after school hours) so declined	• Interest shown by teachers for EE training • Too much red tape and high cost • Teachers unhappy about losing more free time • Reference to specialists delivering EE better than non-specialists • Argument for training for all teachers of PSHE (all topics)	
Teacher interest in EE	• There is interest in the Biology and Geography departments • Staff feel they do not have sufficient time	• Will always be a lack of interest from many teachers • Lack of time affects teaching	• Lack of debate guidance from teachers • Increased workload affects morale for PSHE material	• Some teachers are more interested in PSHE subjects than others • Some teachers like to explore topics unfettered by curriculum or exam • Certain individuals will face this with trepidation

What is EE?	• Alerting pupils to the world around them and the care it needs	• Opportunity for pupil to really talk • Discuss varying points of view • Explore action possibilities	• Education for sustainability	• Raise awareness of env. issues • Education about social responsibility
Community issues in relation to EE	• External agencies do not survive e.g. recycling centres		• External agencies do not survive e.g. recycling centres • School staff are not always willing to be involved in action • Contacts in external agencies are fluid, makes communication and action difficult	• External infrastructure needs to be in place to aid schools in acting in more env. responsible ways
Reasons for decline in school EE	• Illness of certain staff has halted process • Normal teaching duties come first		• Move from cross-curricular days to odd PSHE lessons • Responsibility lies with certain individuals, if individual is unable to continue due to e.g. ill-health there is no-willing 'back-up' • Normal teaching duties come first • Some env. activities have not been successful – creates negative imagery • Student interest was polarising on trivial points and large-scale issues that required cash injection into school	• Time is a restrictive factor • Other areas have higher priority • Money is restrictive factor for a coordinator of EE

Future of EE?	• Sense of integration of environmental work in the school as a whole – in at the foundation level • Occasional specified environmental teaching may be needed • Assemblies are a good opportunity to provide EE – pupils more receptive • Needs to tackle to knowledge absorbing culture and try to touch their souls		• Try to provide continuity across the 6 years of schooling • Would be better to go back to cross-curricular days allowing smaller projects to join up across the year	• Increase in provision of PSHE may make way for more EE allocation • Coverage in Biology and Geography • Perhaps more explicit linking of these subjects to EE and to each other • Assemblies are a good opportunity to provide EE

The key items evident from these interviews were four-fold:

1. ***Environmental education holds a very low position on the priority list of educational provision.*** Although the Head teacher has changed over the course of the research, the overarching attitude towards EE is much the same at this level; EE is a non-compulsory avenue for morals education (Head teacher 1), and there are other avenues that have greater weight in the curriculum. Head teacher 2 elaborated on the factors that contribute to its low positioning:

   Head teacher 2: *So it was in there with careers and health education etc. But I don't know if, if it ever got the sort of, um status that the others got in terms of how far it was implemented in school, so even within our PSHE programme, there and there's so much that has to go into that, um environmental education was only counting for a couple of lessons, so in a way I think, I think there are maybe other areas in the curriculum that might be able to sort of, um raise awareness, as well as, um, that sort of whole school initiative, but then that depends on that outside infrastructure.*

2. ***The un-cohesive approach to environmental education***, which is suggested by the interview responses, means that there is a lack of school community involvement in the case study school, even before trying to continue out into the wider community.

3. ***Confidence and interest in EE is variable throughout the staff***. This may be due to a lack of exploration of the history and philosophy of EE by the educators who are being asked to take part in the provision (Hungerford, 2002).

4. As a result of the previous 3 points, ***restricting factors are 'embraced' and accepted as limitations on the provision of EE***, rather than acted against.

The lack of confidence in successful provision was evident at the highest level, suggesting that perceptions of specialist knowledge and feelings of inadequacy by staff may permeate more widely through the school.

During the summer term of 2001 an educator questionnaire was drawn up to explore some of the points made during the staff interviews and comments made by key informants in interview. Two case study educators were asked to review the contents of the questionnaire, no changes were deemed necessary. Five initial questions allowed the teacher to be identified by length of teaching experience, tutor group, gender, and managerial responsibilities. A further 20 statements required the teacher to respond via a 5-point Likert-type scale (*agree strongly, agree, don't know, disagree, disagree strongly*). Due to verbal feedback from a number of teachers identifying the difficulty they had in deciding between a response and it's extreme version (*strongly*), the scale was collapsed into three points. A list of 30 names was drawn at random from the list of full-time teachers; I, personally, approached the teachers to ask if they would be willing to complete a questionnaire.

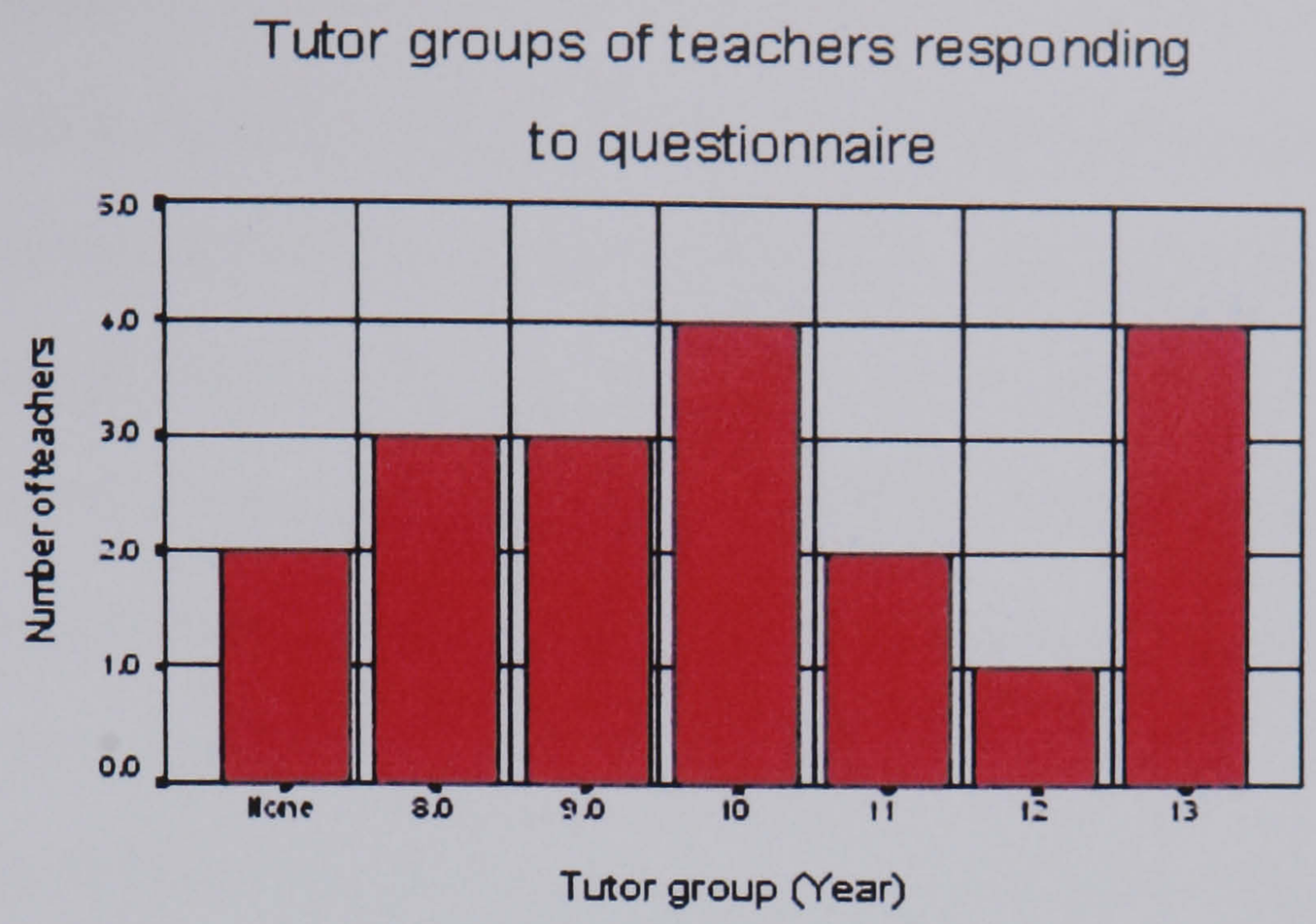
Teachers wished to remain anonymous on the response sheet, however, with the indication of managerial position, I have been able to draw on some knowledge of individual character in this analysis. Over a period of 4 weeks I received 19 of the 30 questionnaires sent out. Apologies were received from staff that felt that they did not have the time to sit down and complete the questionnaire.

The 19 that replied had experiences of teaching ranging from 6 months to 36 ½ years (Figure 20). All tutor year groups were represented by at least one tutor, 2 teachers

did not have tutor roles. Only one member of the sample agreed that they were involved in EE policy making in the school. This individual had been at the school for 31 ½ years and was the Head of Science and well as Head of Biology. Although, he did not have direct input into the EE provided within PSHE, he coordinated the EE delivered via the science curriculum.

One of the remarks to come from two of the interviewed teachers, who were closely involved in the provision of EE to the pupils, was that of teacher training. Although May and Flack (2001) have requested a move from using the term 'training' in relation to teachers' professional development, the term has been retained here as it is widely used and understood by the teachers in this community. Training is being used to refer to a wide range of provisions for teachers, from simply aiding individuals to understand subject specific knowledge to more collaborative and exploratory approaches to education practice. Over half of the sample agreed with the need for EE training of teachers (11 of the 19), followed by 12 agreeing that school should provide EE training for <u>all</u> teachers, 2 were against the idea. Four of the teachers who agreed that school should provide training for all staff went on to agree with 7 others that school should provide <u>voluntary</u> EE training. The two teachers who had disagreed to all staff being trained now agreed with voluntary training. Interestingly 5 members of the sample who agreed to school training all teachers went on to disagree with the training being voluntary; this may be linked to the explanation in the Head Year 9's interview, whereby training for EE had been turned down, as it would be during teachers' free time, after school. Voluntary meetings by virtue of their non-compulsory nature are always held after normal school hours, whereas compulsory training takes place during normal working hours.

Figure 20 - Statistics for Case study educators completing teacher questionnaire



Within this sample there were a variety of management roles included:

1 - Deputy Head teacher, at the school for 6 months (female)
1 - Head of Year & Head of Department (HoY & HoD), at the school for 12 yrs
7 - HoD's, at the school from between 1 ½ yrs and 31 ½ yrs
1 - HoY, at the school for 4 ½ yrs
9 - staff with no position of management responsibility

6 males and 13 females in the sample (male:female ratio on teaching staff = 6:14)

4 members of the sample agreed that they had *received environmental education training at University*:

- Male, 36 ½ yrs teaching experience, HoD
- Female, 4 ½ yrs teaching experience, no management role
- Female, 2 ½ yrs teaching experience, no management role
- Male, 7 ½ yrs teaching experience, no management role

1 member of the sample did not know whether they had received training, 14 out of the 19 (74%) disagreed that they had received training

All of the sample agreed that *It is necessary to teach pupils about environmental issues*

18 of the sample disagreed *Discussing environmental ethics is not the responsibility of all teachers*

2 of the sample agreed that *It is better for younger teachers to talk about environmental issues with pupils*

When asked whether they *would willingly teach about the environment in PSHE lessons*, 16 of the 19 teachers replied positively. However 3 teachers made comments next to their positive response – 2 wrote '*as long as I was provided with info'* (both females, one with 1 ½ yrs teaching experience, the other with 12 ½ yrs) whilst a third teacher (T15) wrote '*grudgingly'* (a male with 14 ½ yrs teaching experience). One teacher replied in the negative (disagree strongly), this was a male teacher with 31 ½ yrs of teaching (1 ½ yrs at the case study school) and two management roles in the school. Fifteen of the sample went on to respond positively to the statement *PSHE is a good way to provide environmental education.* Teacher T15 agreed with the statement and added: '*we don't have to do it in proper subjects!'* This reflected the negative attitude towards EE that was suggested, during the teacher interviews, to be held by some teachers and supported Lucas' identification of 'disciplinary chauvinists' (Gough, 2002).

Table 32 summarises the responses given to two statements relating to action, on the whole this suggests a positive attitude towards environmentally responsible action, but is not an indication of the teachers' personal commitment to it.

Table 32 – Teacher attitudes towards environmental action

	I admire people who get involved in environmental causes		
Pupils should see their teachers acting in an environmentally responsible way		Don't know	agree
	disagree	1*	
	agree	3	15

*Teacher T15

There were more favourable than unfavourable responses in relation to two statements about EE teaching at the case study school (table 33). Six of the sample suggested they were not at ease with this teaching (4 females and 2 males), their teaching experiences varied from 6 months to just under 26 yrs. The second statement related to the importance of teachers working across disciplines, that those without an ecological

background are just as capable in participating in EE in schools as those more traditionally thought to be 'experts' (Oulton and Scott, 1995). Six members of the sample indicated their disagreement with the truly inter-disciplinary nature of EE. The two science teachers that were included in this group differed slightly in their reasoning. Teacher T15 had made it clear, on numerous occasions, that he felt EE was an '...*inferior*...' subject to the pure sciences, his view was that geography would be better placed to handle this '...*human science*...'[31] and that the science department should concentrate on the purely natural sciences. The Head of Science was a biologist and was very keen to ensure that pupils learned detailed and 'correct' environmental science. His view was that non-science specialists might not teach the material appropriately. The other four members of this sample were all HoD's with between 14 and 29 yrs teaching experience. The nine teachers that disagreed that science and geography should have the monopoly on EE consisted of eight females and one male; six of the staff had no managerial responsibility at all, two were HoD's and one was HoY with teaching experience running from 6 months to 12 ½ yrs.

All but one teacher disagreed that *school really won't make a difference to pupils' environmental behaviour.* There were only two teachers who responded in the positive to *environmental problems are greatly exaggerated*, both females, one who had been teaching for 6 months (agreed), another for 28years (agreed strongly).

Table 33 – Teacher attitudes towards EE

	I feel at ease taking lessons about environmental issues		
Environmental education is best taught in science or geography lessons		agree	disagree
	agree*	3	3
	don't know	2	2
	disagree	8	1

* Included in this group was Teacher T15 (a variety of management roles and Head of Chemistry wrote *esp. geog.),* Head of Science and 4 HoD's who had all been teaching for between 17 and 32 Years

[31] pers.comm. feelings established over a period of time (terms used in casual conversations)

This evidence does support pupil comments that EE can be greatly affected by the educator. It has been argued that, by its very nature, EE involves emotions and taps into aspects of identity. I consider the ability of the educator to become more aware of and understand their own identity(ies), and to feel able to expose themselves as emotional beings in the school environment (just as their pupils), to be critical components to EE provision, but beyond the scope of this project (see Zembylas, 2003).

5.5.2 Non-permanent members of the teaching staff

In addition to the four permanent staff that were interviewed, during spring 2002, an informal interview was held with a student teacher who was allocated the case study school for their second placement. This individual was male, in his late twenties and training to teach biology at secondary school. The interview was semi-structured in format and took place in the same room as for the interviews with the key informants. The student teacher had taken over the biology teaching for another member of the science department, consequently, I used this opportunity to talk to the student teacher (Tom) about his approach to an 'open to interpretation' section of the national curriculum for Key Stage 3 – *sustainable development* (see section 1.3). Tom confirmed that he had not received any EE guidance during his P.G.C.E teacher training. His first degree was environmental science and he commented on the inclusion of some EE (in addition to the science) within a geography module. Tom remarked that citizenship education had received much attention during the course; however, it appeared this had failed to include environmental ethics:

***Tom**: I suppose yeh, they see it as sort of, you know, making good citizens out of the people, I suppose, you know, making er , er, you know, religion, I suppose, and tolerance of other people and that sort of stuff rather than you know, the environmental side but you could bring it into that, I suppose.*

Tom's responses suggested that there had been a lack of guidance in how to approach EE in schools, and that any attempts he made would be consequences of his interpretation and interests. The interviewer asked Tom what he was hoping to achieve in his provision of sustainable development to his Year 8 group. He was clear that he wanted to ' ... *get the human side of sustainability* ... ', by exploring the benefits to humans, rather than a simple requirement to conserve the environment. His opinion was that by including the human side of environment the pupils would see reasons for the need to conserve it. In his response he referred to a memory of EE from his A Level Science lessons. He was disappointed to recall that the positive effect of the particular conservation example that was given was attached to the very end of the lesson without integration into the body of the lesson. Tom felt that individuals needed to be educated about the positive effects of conservation programmes on humans as well as non-human targets. He described how his lesson on sustainable development began with him describing eco-tourism and comparing it to more traditional tourism. He used this as a model to differentiate sustainable practices from those considered non-sustainable. He then split the class into six groups, with each group being given an environmental situation (including plantation management, tribal hunting and hotel development) that required the pupils to discuss pros and cons before designing a plan of action that could be reasoned to be sustainable in implementation.

In his opinion, as it was the first time he had delivered the lesson, he felt that his goal was achieved by some of the class, his estimate (from talking to pupils) was a 50% success rate. He remarked that the presentations, made by the pupils, indicated to him that they must have had previous experience of this kind of activity. The memory he had of the lesson was that of presentation of knowledge based material and very limited exploration of values or attitudes towards the subject matter; Tom did feel that the restriction on lesson timing was not conducive to exploration of the affective domain. He recalled that he was responsible for most of the questioning that took place at the end of each presentation.

Tom opined that environmental issues did need to be taught to pupils, that a huge quantity of information exists in relation to these issues that individuals '*...need...*' to know; he referred to '*...fixed figures...*' for resource conservation due to recycling efforts. When I asked Tom to elaborate on his reference to a shortage of time, he commented on the abundance of resources available for pupils, but that restricted lesson time had led to restriction on the pupils' access to resources. I asked Tom about the value he placed on discussion activities, as he had referred to time limitations in relation to exploring pupils' attitudes:

Tom: *It's got, it depends really what you are trying to trying to get out of it, 'cause I mean as a, as a, as a, you know, teacher, you're supposed, I mean I got to sort of remain what is it? not too concerned about their opinions because it 's not, it's not really up to me, their opinions, you know, I'd like to sort of get a, give a balanced erm lesson across so they get both sides, but at the end of the day, you know, I can't really influence their opinions.*

Tom affirmed my interpretation that he considered that it was not the responsibility of the teacher to help the pupil make his or her own opinion. He felt that pupils should have opportunities to discuss their opinions with each other, but linked this back to PSHE as the academic curriculum did not provide the luxury of time for this purpose. His experience of teaching about environmental issues was that a sense of importance or urgency to issues was absent, that '*... it just seems to be that it is just another thing to teach ...*' that if he did not have an opinion on these issues he would view them '*... just another thing to teach next to balancing equations or something like that...*'

I asked Tom whether he allowed his concern to come across in his lessons, whether he would express his opinions to his pupils. Initially he replied positively, however, further questioning revealed that Tom did not actually discuss action as a *personal* reflection of participation in environmental action; he would use group references. He justified this approach by referring to the direction he had received from teacher educators at university.

He remarked that the guidance from university had been absolute; teachers were not to influence pupils' opinions; an approach that some education researchers regard as flawed (Dillon and Gayford, 1997; Smyth, 1995).

5.6 Non case study responses

In comparison to the case study school a second school provided data for inclusion in the research. It was a co-educational comprehensive in a county close to 'middle' England. A teacher-contact was used to aid the dissemination and administration of the questionnaires to five Yr 8 classes and four Yr 7 classes (the entrance year was one year younger than the case study school). I cannot assure the circumstances under which the questionnaires were carried out, however, the instructions provided to the school were exactly the same as to those used at the case study school.

Cronbach's alpha coefficient was calculated for each year group (Table 34), using SPSS v.10 (SPSS, 1999). The value of the alpha coefficient being used as a level for relatively high internal consistency is 0.7 (Pallant, 2001). Internal consistency for Year 8 girls was very high and comparable to the case study school. However, it can be seen that with younger girls and with boys the internal consistency is reduced. The scale had been produced using case study pupils' responses in interview and written tasks. The scale is particular to the case study situational context.

Table 34 – Calculation of internal consistency with non case study school questionnaires

Year group Cohort	Cronbach's alpha coefficient *value*
Year 7 Boys	0.73
Year 8 Boys	0.76
Year 7 Girls	0.75
Year 8 Girls	0.87

The EE provision would not have been identical in the two schools and, consequently, the responses given by the pupils would be based on a differing education provision context. The decision was made, with the problems associated with collaboration from

other schools (see section 5.1.3) and the nature of the scale, not to pursue pupil responses from outside of the context of the case study in this research project.

5.7 Review of the research approach

This case study has not depended on either quantitative or qualitative methods in isolation. The qualitative aspect of the research has opened up the social and cultural construction of the 'variables' explored in the study, whilst the quantitative aspect has provided advantages associated with such an approach to unearth correlations of said variables (Silverman, 2001).

'... no attempt should be made to force data obtained via qualitative methods of inquiry to fit within the parameters necessary for most inferential statistics procedures... use of verbal data should be as credible as the use of numerical data.'

(p18, Smith-Sebasto, 2000)

It appears to have fallen in to, what Kybruz-Graber (2004) calls, the fourth dimension of case studies, in that it was research on a *'specific education situation[s] which aimed to identify key factors relevant in environmental education processes.'* (p55); whilst following a more feminist, action research-like approach. Understanding of the situation was made possible through, primarily, qualitative techniques, that supported *'... a less exploitative relationship... '* between the researcher and the 'research' *'... based on informality, equality, reciprocity, empathy, rapport, and subjectivity.'* (Wincup, 2001). The first set of interviews (preliminary study) were more conversational in style than the later ones. They were informal and opportunistic in practice, intended to explore the disaffection evident in members of the school Biology club. As teacher-researcher, I was able to act on

the information explored, and time was taken to reflect on the degree of success of the changes made. The second set of interviews took a slightly more structured tone, allowing more formal reflection on the state of the club, by the pupils directly involved in it. The third set of interviews retained the semi-structured tone, allowing re-visiting of previous questions and extension along an avenue of query.

The latter part of the study still enabled me to reflect on my practice and the practice the pupils experienced at the case study school. Although self-reflexivity, stimulated by evidence emerging from the study, occurred, my overall practice did not change significantly. This is possibly a consequence of a non-collaborative practitioner-researcher approach, restricting the emancipatory aspect of the research. Consequently I consider I remained a reflective practitioner throughout this latter part of the study, but not an *action* researcher *per se*.

The style I used in the interviews went some way to meeting characteristics of critical feminist methodology (Wincup, 2001), in that I did not treat the interviewee as an objective source of information that simply had to be 'tapped'. I engaged with the interviewee. A reflective discourse approach, allowed me to 'give' the interviewee an insight into the interpretations I was making, consensus was reached on meanings and expression of beliefs. The interviewee was empowered to agree, disagree and further qualify their responses during the course of the interview. Although I endeavoured to avoid judgments in response to the interviewee's remarks, there were times when it was deemed appropriate to legitimise them. This expression of understanding and non-judgmental acceptance of the pupils' responses would influence the dynamics of the interviewer/interviewee relationship such that the pupil would visibly relax, expand on their response or move me to the next question (Stuhlmiller, 2001).

Although young people consider whether to express their true opinions or not when talking to particular people, because of the effect that expression could have (Harter,

1997), in this study the relationship between interviewer and pupil was not threatened and the pupils appeared confident about the security of their responses. This was only possible because of the trust that I had built up between the pupils and myself during their time at the school. Trust came about from complete absence of negative consequences or exposure of personal opinions, consequently the pupils appeared increasingly at ease as the research continued. In most cases, dialogue would continue 'off-tape', once the interview had drawn to a close. This was often instigated by the pupil, and was not discouraged by myself. I saw it as an important part of the research process and my duty as their teacher, especially in instances where the interview had been terminated with negative comments (for example, feelings of disempowerment). It was essential for me to attempt to leave the pupils with a positive frame of mind. This was done by responding to questions on the role of the research, the use of their responses in interview or more general pastoral discussions.

5.7.1 Research impact on the teacher-researcher

As researcher and teacher I cannot escape my own personal history and this will have some bearing on the interpretation made (Wincup, 2001). The collection, interpretation and representation of the information related to the case study school, has all been influenced by my personal position, the emotional responses experienced throughout the study are part of this study (Harris and Huntington, 2001; McLaughlin, 2003). As researcher, my perspective has influenced the study from the onset. It has guided me to investigate a situation that I felt passionate about, and influencing the 'unfolding' approach to information gathering and understanding.

For the duration of this research project, the case study school had gone through a period of emotional turbulence that, at the time of writing, was subsiding for the majority of staff. The EE coordinator demonstrated strong emotions during the first two years of the project. I interpreted this (following some private discussions with colleagues) to be a

response that indicated a concern over professional inquiry. The affective domain heavily influences the teaching context and environmental behaviour; EE (and EE research) will involve emotions, both from pupils and staff. I recognize that my behaviour during this study was influenced by my need to 'tread thoughtfully', to avoid generating professional or academic insecurities or resentments in other members of staff. The emotional interplay between all individuals in the case study school will have fed into the results of the study.

On reflection I feel that the process has refreshed my enthusiasm for teaching and helped to distil out my sense of professional identity (McLaughlin, 2003). I started with a 'hunch', much like that expressed by the educators in interview, that as the pupils progressed through the school they became more interested in self-development and boyfriends – more 'selfish' – and it was this that contributed to the decline in the BioSoc attendance and attitude towards the environment. Moving from the preliminary evidence I was looking for improved clarity, progression in my understanding of what was happening, whilst trying to keep my emotions in check, as frustrated as I might have been with events that occurred during the study.

The practice of carrying out the research whilst teaching full time was extremely demanding; the responsibility I felt for the pupils' education led me to carry out all research out of 'teaching hours'. However, the process has been rewarding in an academic sense, for me personally and for some of the pupils (see next section). My interaction with pupils during interviews and the casual conversations the research activity generated has helped me gain a deeper empathetic understanding of the thinking that is taking place in the pupils when evaluating environmental action. Far from the superficial factors I was attributing to their responses I was entitled to a glimpse at the complex interplay that was occurring in their minds; the root of which is a self- environment dichotomy contributed to by a deficient spiritual education. In addition to this, the frustration generated in me about

the restrictions I felt in the school context was a consequence of the impact the research had on my motivation to effect changes in the education provision to these pupils.

5.7.2 Value to the pupils in the interview approach

The interview process was not purely *data collection* (Oppenheim, 1992); in taking part, both interviewer and interviewees are affected by the discourse. It may have been empowering to the pupils, by providing them with opportunities to talk about their own experiences and opinions, opportunities that are seldom found during the normal school day. Pupils were able to articulate their hopes and ideas for change to EE and thus influence the environmental situation with which they are faced. Aspects of Wincup's (2001) positive elements of the research impact on interviewees (cathartic, opportunity to talk to an interested individual, hope for change) were echoed in feedback provided by some of the key informants when invited to reflect on their experience in the research.

> *'It did help to clear my thoughts on why I protested actively for fair trade, yet did not for other issues, such as global warming or deforestation.'*
>
> (Bev, 2003)

> *'... I found it quite hard to get my thought into the right words, although it probably did make me think about topics like recycling more.'*
>
> (Sandra, 2003)

Sandra felt she would have found the experience more beneficial if she knew that by sharing her thoughts with an adult she would be able to effect a change in something she felt strongly about.

'It was a valuable experience to be able to discuss such things with a member of staff and give my opinions without being criticized.'

(Alison, 2003)

The questions asked of the key informants, during the interviews in 2000 and 2002, were such that they were being asked to relate their story, their narrative (Brockmier and Harre, 1997) of the relationships and events taking place in school. By asking the pupils for their knowledge, from their privileged position as 'insiders', I was acknowledging the power they held as informers; they knew things that I did not, or they had greater understanding than I did; it was their choice whether to disclose this information or not (Stuhlmiller, 2001).

5.7.3 Interpretation issues

It was clear from interviews that group dynamics played an important role in these adolescents' lives. Overt behaviour seen in groups may well not correlate to the attitudes expressed in questionnaires due to the individualistic nature of the questionnaires and the fact that group interaction requires a degree of social skill (Solomon and Harrison, 1991) that will allow an individual to respond to the dynamics of the group and at that time and thus not necessarily being able to press their individual attitude.

Within the questionnaires, the reasons for putting *'don't know'* will vary, but those included by the pupils as comments on the evaluation sheet are:

- Unsure about the statement
- Unsure about their position
- Don't know enough to come up with a response

Perhaps the teaching approach in EE has some influence here. The mechanistic, reductionist approach to environmental issues teaching has removed the potential for critical analytical skills to be developed by pupils and has distanced the pupil from the generation of information. These may be steps used to reduce uncertainty of environmental issues and encourage and enable the pupils to form opinions, even if the issue is explored for the first time (Fortner et al, 2000). Responses by some of the pupils point to not being happy with the use of 'don't know'; this dislike of the use of the unequivocal predetermined response by girls is reported elsewhere (Solomon and Harrison, 1991). Responses in class often indicate that pupils locate themselves in a 'Received Knowledge' position (Belenky *et al*, 1997) in which they demonstrated affiliation to polar knowledge (answers being right/wrong). In the case study school, many of the pupils *'... collect facts but do not develop opinions... ... ...feel confident about their ability to absorb and to store the truths received from others. As such, they perceive themselves as having the capacity to become richly endowed repositories of information.'* (p42/43, Belenky *et al*, 1997).

Although pupils did not identify phrases that were difficult to comprehend, there was an indication that variability in interpretation of particular terms does warrant further investigation. The term '*environmental issues*' may have been interpreted differently by different pupils (Thapa, 2001), crude analysis of a simple definitions task from the summer term 2001 with Yr 8 suggest that a variety of concepts are held by pupils in relation to this term, including:

- Debating
- Campaigning
- Action by humans for the environment
- Solutions to environmental problems

- Events happening in our surroundings
- Problems in the environment

The responses in the free writing, the questionnaires and the interviews are all self-reporting instances. However, researchers have accepted that reduction in reliability, caused by self-reporting rather than direct observation, does not render the data invalid in attitude-behaviour research (Tarrant and Cordell, 1997). As a teacher in the case study school, I was better placed than an external researcher to validate some of the reporting received in this way. However, as a full time teacher, I was unable to be in all places at once, consequently, some events recorded, such as in the diary, are as a result of being relayed to me through a pupil or colleague and not a 'first-hand' experience.

This case study does not attempt to describe the environmental-values approach that dominates in a particular group of pupils in the school, what it does attempt to do is to contribute towards a better understanding of the multifarious nature of environmental values development. The study goes some way to meeting the recommendations of Iozzi (1989) in relation to consideration of specific EE provisions and the changes seen in environmental attitudes or values.

This research study has been conducted in the spirit of the guidelines suggested for EE research (Smith-Sebasto, 2000).

5.7.4 Strengths and weaknesses in the methods used in this study

This case study has benefited from the author/researcher being a full time member of the teaching staff at the school during the period of data collection. As a member of the school staff I had greater access to information held within the social and documented aspects of the school. However, the fact that I was full time at the school did place some restriction on the research activities, as data collection and interim analysis were moulded

around the termly teaching and assessment commitments incumbent on a full time secondary school teacher. The intensity of the longitudinal nature of the study is clearly visible in Table 10.

As was found with other researchers new to grounded theory (Backman and Kyngäs, 1999) problems did occur with the shaping of the project as data collection, data analysis and conclusion building often occurred at the same time. The preliminary study did not relinquish itself to the main study, with questionnaire design being influenced by '*live*' evidence. The pros and cons of the methods used in this study have been referred to throughout the thesis, however, a summary is presented in Table 35.

Table - 35 Summary of limitations and positive aspects of the research methods employed

Method used	Strengths	Weaknesses
Observation	✓ Provides context for the study ✓ Allows for an inductive approach ✓ Researcher gets direct, first hand experience of events as they occur ✓ Acts as a check against bias, prejudice and selective perceptions ✓ Builds on researcher's knowledge and/or enhances understanding ✓ Allows the inquirer to see the 'whole' picture	✗ May alter setting through presence of researcher ✗ May not clearly differentiate objective and subjective information ✗ Can be very time consuming, masses of data ✗ Too much involvement of researcher ✗ Inadequate addressing of researcher's perceptions and biases ✗ Insufficient setting capture – can't observe everything
Interviewing	✓ Researcher can move back and forth in time to construct the past, present and predict the future ✓ Access the otherwise inaccessible ✓ Check observational information, reflections and emerging theories with members of the setting ✓ Systematic gathering of information ✓ Gain new insights and perceptions	✗ Information and responses are highly reflective of interviewee's perceptions and biases ✗ Dependent on interviewee recall ability ✗ Influence of interviewee emotional and physical state ✗ Effect of reactions to and interaction with the interviewee ✗ Dependent on interviewer skills
Documentation	✓ Can provide a wealth of information, some may not have been accessible any other way ✓ Provide highly reliable information (legal and official documents) ✓ Easy and cost effective to duplicate ✓ Often readily accessible ✓ Confirmation of other sources of information ✓ Provide different perspectives on similar information ✓ Retain context of setting	✗ May be of poor quality, possibly inaccuracies, incomplete ✗ Can still reflect perceptions and biases of participants

(taken from Cantrell, 1993)

6 Review of the case study outcomes

6.1 The reality of environmental education at the case study school

Traditional methods of EE, which includes those used at the case study school, are based on a simple premise; that the acquisition of knowledge about the environment will lead to awareness changes which will culminate in more environmentally responsible behaviour (Hungerford and Volk, 1990). The case study school is likely no different to many other secondary schools in that there is a predominance of use of empirical-analytical science to present facts *about* the environment to the pupils (Huckle, 1993), with restrictions on the exploration of values and values development. Educators are still unsure as how 'best' to approach EE, often shifting responsibility for it from science to humanities education (Gough, 2002) rather than visioning it as a vehicle through which all other subjects are united; this 'educator insecurity' was evident in the case study school (section 5.5.1).

Previous experience of EE must be taken into account when considering EE provision for secondary school pupils. Informal conversations with the pupils at the case study school suggests that exhaustive or poorly planned EE at the earliest levels can have a detrimental effect on the attitude pupils have towards this process. Pupils may then have preconceptions as to the validity of EE, which may demonstrate itself in negative behaviour towards lessons or tasks with an overtly environmental theme (section 4.5.4).

The predetermined activities presented in an edition of Primary Science Review (Mant and Summers, 2002) suggests that, for all the debate that takes place, provision of EE has not come very far. Mirroring the comments made in interview with the pupils in this case study school (about their primary school experiences) the authors described preliminary preparation lessons, poster making, questioning and encouragement of appropriate environmental behaviour from pupils. This article was written approximately six years after this case study's secondary school pupils experienced this kind of primary education, and yet it would seem

that the lesson designs do not seem to have altered significantly. This is nowhere near providing for the critical thinking and autonomy that are included amongst the objectives of EE. In addition to this, if student teachers are indeed being advised by training establishments not to bring their own opinion into the classroom debate on environment (section 5.5.2) pupils will be missing the very discourse central to environmental issue consideration and EE itself. This 'self-control' by the teacher is in direct conflict with the language of science curricula, which includes 'shoulds' and 'oughts' and therefore is implicit in its requirement of moral and ethical issue exploration (Poole, 1995).

6.2 The effect of the educators' views

A holistic approach is not used in the case study school; as with most UK secondary schools, pupils are separated into year groups and are taught subjects in an isolationist approach (Gough, 1987); but with an effort to provide for cross-curricular studies. At the very least, some education ***about*** the environment will exist within the boundaries of the national curriculum provision in discrete lessons. In addition to this, there are elements of education ***through*** the environment provided at a number of levels in the school, for example Yr 8 pond dipping lessons in Biology, Yr 9 visits to historical sites and language exchanges, Yr 10 Geography fieldwork at a local beach and opportunities for fieldwork in the sixth form; to name a few. What is lacking is education ***for*** the environment based on critical science designed to educate for sustainability. Within the Head teacher's interview there is reference to the provision of EE to develop awareness (section 5.5.1), however, by stopping at this and not providing for the emancipation of pupils, they are open to, and from their interviews there is evidence of, the restrictive quality of this type of EE (sections 4.5.4 and 5.2.3.5). Pupils may become more aware of, increasingly global, environmental issues but feel unable to take any mitigating action.

Huckle's (1993) view *...that 'education for sustainability' is not a priority...* ' for most teachers in the UK is echoed by the current Head teacher of the case study school, when talking about the, now defunct, 'cross-curricular themes'. She confirmed that EE did not exist at the level of policy within the school and that this is directly related to externally imposed educational priorities (section 5.5.1)

As with other schools, the rhetoric is very different to the reality when looking at teachers acting on their statements regarding the cross-curricular approach to EE (Jimenez and Lopez, 2001). Head teacher 2 opined that acting in environmentally more responsible ways

needed to be made easier for people, that community infrastructure was inadequate for individuals and groups to act, practically, on their 'raised awareness' (section 5.5.1).

Although all the teachers, who responded to the questionnaire, agreed that it was important to teach pupils about environmental issues, it is clear from these responses and from teacher interviews, that this 'teaching' was *knowledge* oriented. It was indicated, at the highest managerial level within the school, that EE is still associated, primarily, with science and geography (section 5.5.1). Knowledge has been separated from values, and in EE that means a lack of spiritual understanding. In the absence of engagement of empathy in pupils, EE is reduced to 'transmission of' factual information. It is not an education that will contribute to the development of their interpretive and decision-making skills. Pupils need to form opinions, to use knowledge to explore their values, in order to do so the teacher will need to have opinions that they are ready to share and reason with their pupils. This may be entering uneasy territory for some teachers, as was indicated in the teacher interviews and questionnaires. Reasoning needs to be built on sound scientific knowledge and understanding, interviews and questionnaire data indicate that this is not true for all teachers involved in EE in the case study school. Teachers need to be competent in discussing and arguing complex environmental issues, itself, an issue for teacher training establishments (Ekborg, 2003). This aspect of citizenship education is beginning to be recognized in the turning tide, away from traditional, objective, value-free education (ASE, 2002).

6.3 The pupils' views

EE was, and still is, a non-compulsory aspect of school education in the UK. In the current educational climate, the inclusion of education for sustainability in the curriculum is restricted and vulnerable to minimization. Historically, in this case study school, it has been provided in sessions quite separate to 'normal' subject teaching. The non-compulsory nature and isolationist approach to its accommodation in the school timetable has resulted in highly variable provision by educators (section 5.5), in addition to skeptical participation by pupils (section 5.2.7). When pupils were questioned about their feelings towards EE and the actions they took with respect to environmental issues, they expressed a lack of effort; they had difficulty in generating motivation. The interviews revealed that pupils placed environmental issues and EE at a low priority level in their lives, they did not see them as important (sections 5.2.3, 5.2.4, 5.4.1.1, 5.4.1.2). This situation was identified as part of the EE dilemma with Swedish pupils at an Environmental and Schools Initiative meeting (OECD-CERI, 1995). The study reflected the necessity to involve pupils in the process of EE, to plan EE based on the values the pupil's articulated. Pupils in this case study echoed the call for aspects of this 'pupil-centered' education plan (section 5.4.1.3).

The evidence from interviews in this case study go some way to supporting other work (Ashley, 2003b), which suggests that credibility of EE is affected by pupil perception of the educator. Even though observably lacking in motivation to engage, fully, in the process of EE, the teacher may be unaware of the negative, or at the very least, the neutral response to the lesson, by the pupils. The pupils interviewed in this case study expressed acceptance of the condition presented to them at school; the school provision is seen as beyond their control (external locus of control), with no empowerment to change the situation, pupils went through the motions of the lesson but did not express much virtue in their doing so.

6.4 Case study findings and existing literature

6.4.1 Identity

Whether we live in a time of late-modernity, high-modernity or (embryonic) post-modernity, one can see a preoccupation with the individual; it is a time that has

'...released impulses for personal growth and autonomy. In consequence, individuals are now actively involved in building and rebuilding a sense of coherent identity and authenticity for themselves.'

(p77, May and Cooper, 1995)

This may be in the form of concentrating on examinations or in more social aspects of their identity. In interviews it became clear that pupils were very conscious of examinations and personal academic progression. EE *per se*, is non-compulsory and consequently is not used in examination materials. In a culture where education is valued as a means to qualifications without intrinsic value in itself (Hufton *et al*, 2002), pupils will be inclined to reject this 'excess baggage'. For the secondary key informants, their involvement in BioSoc meetings gave way to focusing on their individual needs in the run up to Key Stage 3 SATs. During the later part of Yr 10 and into Yr 11 preparation for G.C.S.E. examinations was referred to as a priority (section 5.2.7). The examination grades become a public statement; they are part of the academic progression of each student used by employers and institutions of higher education. Consequently, they contribute to the identity of the pupil; assumptions are made about pupils based on the subjects studied and the grades achieved, both by educators and non-educators.

The pupils indicated that they do not really think about anything other than that which affects them, their 'selves'. Consideration of environmental issues requires reflection on social and ecological concepts and phenomena; concepts and phenomena that are <u>not</u> perceived to be related to them due to a dichotomy that appears to perpetuate in the pupils minds. This

separation of self from 'other' environment, increases the social distance between the two and may reduce the likelihood of an ethic of care approach used in the pupils' moral reasoning (Ryan *et al*, 2004). As with individuals in research by Payne (2001), the case study pupils reported not seeing any effect directly on themselves and so did not really have any feelings about changing their behaviour (apathy), instead moral reasoning may be dominated by a justice approach. This approach does not necessarily provide for what is in the best interest of environment, as individuals play the game of 'modern' society, adhering to *its* rules and sticking to societal principles.

The pupils did not acknowledge their *being with* the environment. I consider that this 'connection' with environment falls within the spiritual domain of self-identity (Pedersen, 2000), an aspect that is not being explored within the current EE provision, consequently environment is not contributing, to any great extent, to identity development. This has significance when placed in the context of the pupils in the study – adolescents greatly preoccupied with identity development.

In interview both Head teacher 1 and Yr 11 pupil 1 (section 5.4.1) had referred to the selfish nature of the individual at school. This was expressed in a way that described the preoccupation, primarily, with one's self. EE may need to tackle this personal attribution in such a way that it enables individuals to explore and widen ' ... *the domain of the self* ...' (p180, Dennett, 2003); if one's domain of self is wider then one's selfish actions may be much more widely beneficial. EE goals that are seen to have congruence with an individual's personal goals will have the greatest effect as they then become an essential part of the individual's definition of self (Huitt, 1999). This may be more relevant at the individual school level rather than through prepared or mass-produced EE 'packages', as there is some indication that school *type* (ideological viewpoints) may be influential in adolescent identity development (Roker and Banks, 1993).

There may be potential for individual expression of innumerable options in lifestyle, but a disparity in potentiality and actualization can lead to resentment (May and Cooper, 1995). The interviewed pupils remarked on the alternatives to environmentally damaging lifestyles and how barriers, perceived to exist, have generated negative attitudes within themselves. The barriers identified such as lack of resources, skills or knowledge can all be related to an externalization of locus of control. Pupils' expression of lack of autonomy may go some way to explaining the resignation of choice restriction due to these perceived barriers and, consequently, indicate the degree of commitment to the lifestyle action by the pupil.

In interview Kath had described her deliberation over clothing purchase, using consumerism to define her own identity (Head, 1997;Dillon et al, 1999). This consumerism served self-interest. Pupils can behave as a '*self-authoring subject*' (p79, May and Cooper, 1995), as did Bronwen when reconsidering which clubs to attend (section 4.5.3). However, during informal discussions, some pupils had recalled making (consumer) decisions based on socio-ecological understandings (such as the reference to *Fairtrade™* items). Their behaviour is not that of an individual acting in a solely, rational self-interested manner, but rather that of one acting on their ethical obligation and self-identity. In considering ethical consumer decision-making, the theory of planned behaviour (Ajzen, 1988) was found to be too simplistic by not accounting for factors independent of self-interest (Shaw and Shiu, 2002).

Environmental sensitivity is relevant to environmentally responsible behaviour (Sivek and Hungerford, 1990) and this empathy is likely to be influenced by the degree of identification with environmental concerns. Consequently, in addition to consideration of personal moral-ethical codes, there is also a need to include self-identity in the development of behavioural intent and to modify the theory of planned behaviour (Shaw and Shiu, 2002).

Pupils identified a shortcoming in the affective component of the EE they had received as

early as Year 8 (section 4.5.4); a lack of empathy (identification) *with* environmental concerns is less favorable in terms of contributing to the behavioural intention of the individual.

In interviews it appeared that pupils acted differently with their friends than they might have done had they been acting in complete alignment with their beliefs as expressed in interview. All the key interviewees remarked on how their actions, even to a small degree, were influenced by the evaluations made by those around them – their true selves were masked. This seems to increase from Year 8 onwards as the girls remark that in Year 8, as they are not familiar with other pupils, there is a lack of awareness of evaluations being made but this awareness increases as friendships involve more talking and become deeper, self-consciousness increases:

> *.....the adolescent becomes more self-conscious as it becomes more apparent that one is the object of others' evaluations. Thus, adolescents may attempt to obscure their true selves if they feel that they do not measure up to the standards and values set by others whose opinions are critical.'*
>
> (p83, Harter, 1997)

There is a need to act in socially acceptable ways, for stable connection with a section of society. Pupils will not change behaviour if it means going against the group dynamics, although the pupil may believe a certain course of action is more desirable for the environment, they may not follow it because of a greater attachment held between themselves and their social group (greater desire for solidarity, possibly a protective function of this type of action).

It is clear from the text in the interviews that the pupils identified themselves with particular groups of friends and were able to distinguish themselves, as a group, from other groups in their form. Distinctions were made based on perceptions of:

- intelligence
- interest in academic subjects
- popularity
- fashion sense

and were similarly described from pupil to pupil, following the premise of Taifels' Social Identity Theory:

'...what defined a group was not its structure, function, or size, but it's social reality; that is, a group exists insofar as its members "categorise themselves with a high degree of consensus in the appropriate manner, and are consensually categorized in the same manner by others"..... ...Individuals obtain an assessment of their in-group's value relative to out-group through social comparison processes..'

(p114, Thoits and Virshup, 1997)

The last part of the quote is clearly seen in Kath's Yr 11interview when she says that the popular group probably would not *want them anyway*. In her opinion, individuals in this group think highly of themselves, placing themselves in a social rank above other individuals. By using the phrase *'don't really see it myself'* – she perceives the group evaluation as illegitimate, this is followed by a shift to a comparison with a completely different *'out-group'* (Thoits and Virshup, 1997). The factors involved in group formation will be multiple and complex, however, combinations of factors can lead to summary identities being recognized by non-group members. Kath did talk about single names being given by one group (the popular group) to the other groups as a symbol of their perceptions of group identities.

Although, it is not a similarity on one social characteristic that is being used in intra-group unity, it is a way that groups identify between each other and are able to identify themselves by contrast with other groups.

6.4.2 Action

The case study school is situated in an affluent county in the UK; house prices are some of the highest in the country. In 2000, their OFSTED report identified 18 individuals from a total of 1011 pupils that were eligible for free school meals (less than 2%). On the whole, the pupils in the case study school are academic, high achievers, with the majority of pupils going on to further education.

The key informants and the pupils in the peripheral interviews opined that their lack of concern for environmental issues was a consequence, in part, of their not being able to feel or see the effects, personally. Unlike the Australian women in Merchant's (1996) report, the case study pupils lack the motivational factor of caring for an entity that has direct consequences for their own health and welfare.

'It certainly seems that change will likely result if a message is specific and clearly explains the consequences and benefits of individual actions for the individual.'

(p 23, Gigliotti, 1992)

In addition to this lack of affective stimulation, pupils referred to inhibitors to actions such as recycling and avoidance of car use, illustrating the significance of perceived behavioural controls in influencing environmental behavioural intentions and consequently actions (Dillon and Gayford, 1997).

The interview evidence suggests that pupils believe that parental control restricts them in carrying out certain behaviours. In consumer action and lifestyle choices, pupils interviewed perceived the locus of control to be external in many instances. Ballantyne *et al* (2001) reported that parents were more pessimistic than their children about impacts of EE programmes on the pupils. I wonder whether this lack of optimism is an indication of a lack of support by the parents leading to a lack of empowerment of pupils, which cycles back as parental interpretation of a lack of change in their children.

Characteristics of long-term project work, enjoyed by the case study pupils interviewed (section 5.4.1.3) echoed those of similarly aged female pupils in the study by Ballantyne and colleagues (2001):

- they liked the opportunity to present their own work
- they liked learning and investigating problems in the field
- liked doing audiovisual presentations, preparation and listening to others

Peripheral interviews support remarks made by the key informants that discussion work has great benefit for understanding one's own, as well as other people's, points of view. This preference for a more collaborative approach to learning is well known (Solomon, 1997). The key informants referred to the importance of *experiential* learning, exploration of being ***in*** the environment, and to family influence in development of positive attitudes and interest in environment. This echoes some of the results from research that explored significant factors for the pro-environmental behaviour of UK environmental educators (Palmer and Suggate, 1996). However, in Palmer and Suggate's work it appeared that negative influences had promoted positive responses in individuals. This was not borne out by all pupils in this case study who, still at an earlier stage in their lives than the aforementioned study, responded to pessimistic environmental reports with a degree of resignation. In one interview in Yr 9 Bronwen reiterated the importance of **seeing** something in relation to the environment to help

her comprehension of the issue. A call for a different type of learning process that allowed inquiry and participation in more practical activities was found with Polish high school students (Robinson, 1999). This is an approach readily used with primary school children (Mant and Summers, 2002) but seems to be used less in secondary school as pupils are being required to process more conceptual/abstract ideas. Reduction in fieldwork activities, as pupils progress through school, is becoming a common picture in the UK, a turn of events that is negatively impacting on the exploration and discovery of personal enjoyment of nature, human and non-human (Barker *et al*, 2002; Gates, 2003). Pupils, in this study, commented on the positive influence of having experience of the outdoors, nature, and visits to other places (sections 4.5.1, 4.5.4 and 5.4.1.2). The importance of childhood experience of environment outside of the classroom, that is getting pupils outdoors and the importance of role models, as mentioned by the pupils in interviews is echoed in research into the important life experiences recalled by adults who have chosen EE careers (Palmer, 1998; Sivek, 2002). The learning 'atmosphere' plays an important role in the success of the learning experience. As in other studies (Knapp and Poff, 2001), the pupils interviewed in this case study had long lasting memories of experiential learning instances when they were younger (section 4.5.1) or when peer actions become triggers for memory recall (section 4.4.2.2).

Responses given by the secondary key informants, regarding influences on their interest in participating in a school club can be transferred directly to the provision of EE (a voluntary, life enhancing activity). These characteristics are the preferences pupils have shown in their personal participation in action. Taking the responses that were supported by at least 50% of the secondary key informants one is left with a list that looks very similar to elements of action-oriented and social critical approaches to EE (section 5.2.7):

1. Peer influence –	the positive effect of participating in something with friends, allow pupils to work with individuals they wish to be with, foster an atmosphere that embraces relationships
	atmosphere generated should be inclusive and desirable so that negative effects of peer criticism is extinguished
2. Interest in the subject	focus on activities that are of interest to the pupils, avoid the practice of imposition,
3. Novelty of activity	the process of environmental education should emerge from the individual situation found with each new group of pupils, there should be scope for pupils to extend into novel (to them) strands within the umbrella activity
4. Provision of time	participation in environmental education requires adequate time, activities may be very lengthy, curtailing to a strict timetable can negate the experience
5. Age appropriateness	pupils will engage in a process that clearly respects their age and maturity
6. Responsibility	agreement is needed between all participants as to the acceptable degree of responsibility for individuals so that successful, continued, engagement is fostered

6.4.3 Uncertainty and risk

Environmental issues are fundamentally uncertain in nature. This uncertainty may be a contributing factor in pupils' perception of risk to themselves by environmental issues. Interview evidence in this study suggested the absence of absolute belief in personal investment in environmental crises (sections 5.2.2 & 5.2.7); freewriting evidence supported a shift in temporal and spatial environmental thinking in pupils and consequently a distancing from the individual. Statement 20 in the questionnaire demonstrated the degree to which pupils in the case study school did not see themselves as directly at risk from a 'high profile' environmental issue:

Q20 – We will have used up all the natural resources (e.g. oil) in my lifetime

In each year group (Year 8 through to Year 11), the proportion of pupils who responded with '*Don't know*' lay between 36% and 46% [M=41.75, SD=2.95]. That is to say, in each case, over a third of the year group felt unable to present an opinion on the risk posed to themselves by non-renewable resource depletion. This inability to present their opinion is done in an atmosphere of media coverage of resource depletion and political concern over fossil fuel production as well as statistical evidence presented to pupils during Key Stage 3 and 4 Chemistry lessons[32]. The inconsistent projections of fossil fuel availability must go some way to explaining the indecision expressed by the pupils. Between 15% and 33% of pupils in each year group disagreed with this statement [M=25.31, SD=5.14]. This potentially large population of pupils indicates an absence of urgency in alternative fuel usage. Year 11 interviewees had identified that their actions may not be considered commensurate with environmental concerns. However, perhaps the move to more global and more spatially

[32] pers.comm. with case study Chemistry staff

disconnected environmental concerns may serve to reduce environmental attitude-behaviour conflict in pupils (Nordlund and Garvill, 2002). With a shift in emphasis of environmental concern towards issues that are increasingly perceived as 'far-off', future events, one's decision to use the car today can be brushed off as environmentally insignificant.

Ashley (2000a) reported that a large proportion of 11-year-old pupils (40.4%) in one study reported it was not worth worrying about risk related to global warming as it was so far in the future, echoing the opinions of pupils recorded in this case study. Pupils recognize the concepts of risk and uncertainty, their perception of reliability of scientific statements are used to *'weigh up'* the risks, which will in turn contribute to their level of concern over environmental issues and consequently their attitude towards personal action (Ashley, 2003b). The pupils in this longitudinal case study demonstrate a shift from local, more immediate, environmental concerns to those that are more national/global and distant to the individual (Chapter 4). Consequently, feeling of connection to the environmental issue will be lower and thus the associated risk will be more detached. This shift in spatio-temporal location of concerns by the pupils impacts less on pupils' commitment to action, and may be a coping mechanism developed in response to the *'risk society'* (Beck, 1992) of which they find themselves a part.

6.4.4 Sensitivity for/with Environment – re-emergence of Spirituality

There is evidence from the interview data that the pupils lack sensitivity for the wider environment (that is other than their human environment). Humans have an innate capacity for sympathy or '… *sympathetically resonating passions* …' (p327, Smith, 1993). We may act on our sympathies for other human beings (to varying degrees) and help them when in distress. We may help an individual in order to ease suffering or perhaps act in such a way to ensure justice is done. Sympathy may develop deeper into empathy for the 'other'. At the time the

'just' act is carried out it may not seem clear that the individual carrying out the act is benefiting but it may be a long-term benefit, yet to unfold. If the pupils felt sympathy or empathy for their non-human environment perhaps they would be more motivated to act for its benefit and thus their own benefit in the long term. The comments made by all of the pupils interviewed in this study resonate with Ashley's research findings (2000b) interpreted as '... *the replacement of childhood spirituality by teenage consumerism, through the processes of socialization and enculturation. There appears to be a movement from a naive form of humans as respecters to a strong form of humans as users. Spirituality is lost rather than developed.*' (p142). The decline in environmental 'attitude' at this time of early adolescence, as suggested by the questionnaire evidence, echoes the decline seen in their spiritual awareness in other areas of life where, as in this study, adolescent girls refer to the emphasis on teaching of 'dangers' (risks associated with behaviour) and the lack of 'feeling' in the education (Halstead and White, 2001).

It may be more common for humans to show sensitivity towards animate non-human objects and express outrage when their treatment is deemed to be morally reprehensible. Smith (1993) suggests humans do have moral valuation of inanimate 'things', but we are able to offset normally destructive behaviour by considering the object in an alternative light (against the rest of it's environment) and thus the action becomes constructive and acceptable to our morals. His example being the destructive action of removing plants from a garden, becoming acceptable when viewed as removal of weeds for the benefit of the garden. In the case of purchase of non-organic vegetables, the argument can be made that in the use of pesticides the nutritional quality and productivity of crops can be assured which benefits human and non-human environment by reducing the acreage required for farming, and the quality of food in the human diet. This offsetting of values may be a tactic used to avoid affective conflict.

Although it would seem that strict justice is not required for those creatures incapable of sensing justice (Rawls, 1972), rather than being dealt with *unjustly* the creature can be acted against with respect to it's own *sake* (Smith, 1993), however,

'... inanimate things do not have the subject-relative kind of sake except indirectly, when they are adopted by subjects who feel for them (reading themselves into the things) or who feel for themselves in relation to the things.'

(ibid, p334)

This 'feeling', or 'reading', may not be occurring during secondary provision of EE. During interviews with the secondary key informants, there were instances of specific reference to this absence of relationship, expressed as care, by the pupils themselves and concession of its effect on their environmental concern and behaviour (section 5.2.7). This 'reading' is an empathy that echoes the principles of deep ecology (Naess, 1988) without a need to turn to New Age ideologies. Indeed, this return to *spirit* may not be the sole responsibility of EE but of the wider environmental movement; a need to change to what Kumar refers to as '*reverential ecology*' (Kumar, 2004). The incompatibility of science and spirituality must be questioned (Russell, 2003); science education needs to encompass the exploration of interconnectedness between the inner individual and the environment that extends beyond if there is to be attendance to pupils' self-reported deficient environmental sensitivity. Rather than providing education for the development of the individual with importance placed on examination results (target setting and target getting) evidently, at least in part, responsible for some pupils' dissatisfaction with the case study school (section 5.2.7), this explicit attention to ecological interdependence is more compatible with a 'holistic education' (Taggart, 2001) and could tap into the emphasis on 'relationship' that is evident

within this study with adolescent girls. It is clear that support and encouragement is required at the teacher level (section 5.5.1) for the provision of pupil opportunities to explore all aspects of one's spirituality (Elton-Chalcraft, 2002). In Taggart's opinion *'Holistic education embodies this kind of spirituality in that its conceptions of democracy, freedom and citizenship encourage the development of relational view of the self.'* (ibid, p332).

6.4.5 Youth as Citizen

The pupils in this case study are living through a contextually bound period of their life socially described as their youth. Contextual considerations within the decision-making process have been explored in this study by taking a methodological approach that encourages *'self-representation'* by the pupils (p528, Morrill *et* al, 2000).

In interview pupils talked about not having much purchasing power due to the purse-strings being held elsewhere. They remarked that it would be easier to behave in more environmentally responsible ways or actively participate in activities if they felt recognized as valued, contributing citizens (holding rights as well as responsibilities). In interviews they commented on their progressive pre-occupation with academic achievement, developed within an educational system that places an emphasis on the individual rather than one that embraces shared knowledge, shared power. There is a conflict here between the environment they find themselves in and the environment in which they wish to be.

'Citizenship', intimates participation in public life and, consequently, is more accessible to individuals who are already deemed by society to be contributing to public life, that is to say, the wage earner. This can lead to limitations on groups in accessing full 'active citizenship', two of these groups being children and women (Buckingham-Hatfield, 2000). Evidence from interviews and questionnaires support the restrictions these young girls feel in terms of their contribution to society (sections 5.2.2, 5.2.7 & 5.3.2.18). This lack of connection

between adults and young people reflects one of the symptoms of youth culture that is aided by the current secondary school system (class sizes, number on role, length of lesson, number of teachers per pupil) (Marshak, 1995).

May and Cooper (1995) referred to individuals in Britain being '*... increasingly seen not as citizens but as the consumers of services...* ' (p84) which is now being redressed from within the national curriculum. However, the remarks from interviews go some way in supporting a pervading 'consumer' approach by the pupils, and 'labeling' by teachers (based on their empirical evidence), which serves to reinforce the pupils' responses. The rights and duties of a citizen are not part of the pupils' fluent vocabulary, yet. The dots are not being joined between the responsible environmental behaviour 'rules' and the scientific 'facts' of the environmental issues; individually, in which the pupils were well versed.

Removing the socio-political aspect of environmental issues in the provision of EE, by dealing with only the 'scientific facts' can project the issue in purely technical terms. Consequently, most citizens will feel dis-empowered, the locus of control being externalised and firmly in the grasp of the 'experts' (Di Chiro, 1987). In interviews and questionnaire data is seems that pupils still, fundamentally, believe that remedial effects need to come from large institutions such as industrial plants, to say, control pollution. They feel that what they do is insignificant. Yet research suggests that industry is well regulated and it is individual citizens that hold the key (Gigliotti, 1992).

6.4.6 The nature of the girls' 'environmental thinking'

The increasingly contextual nature of decision-making was evident in interview with the older pupils. In year 11, pupils found it difficult to commit to environmentally positive changes in behaviour; they would refer to the circumstances in which the behaviour would be possible and instances when it would not, for instance when:

- Kath (key informant interview) needed to explore more contextual details of a scenario before discussing her potential action (section 5.2.7)
- Yr 11 student 2 remarked that the state of the weather was influential on her transport decisions (section 5.4.1.1)

Comments made by pupils in interview suggest a tendency for pupils to be more supportive of technological combating of environmental issues as was seen with Thapa (2001), and thus a transfer of responsibility from themselves. There were frequent references to recycling in both intention and overt action. An action that involved minimal input from the individual, once the waste has moved from their hands to the recycling company, a technical process will take place that then absolves them of further responsibility. The pupils are happy to turn to a techno-fix solution rather than sacrifice any part of their lifestyle or increase their level of commitment to their concerns by behavioural changes. The pupils in this case study are not unique in their responses, Robinson (1999) found that a large proportion (80%) of Polish high school students, included in his study, believed that technology would always find an answer to environmental problems. In Gigliotti's study (1992) it seemed that those individuals who believed in the potential success of science and technology to solve environmental problems were those individuals who were less willing to make personal sacrifices.

The questionnaire data, in this study, provided some insight into the approaches the pupils were taking in their environmental thinking. Although, fundamentally, there were similarities in the approaches taken throughout the age groups, the subtle differences were also very telling. On the whole, pupils seemed to be approaching the questionnaire with two main avenues of thought (sections 5.3.2.11 - 5.3.2.17). One aspect of their approach was to consider their knowledge and understanding of environment and environmental issues and to

evaluate it in the context of their environmental sensitivity (which itself includes personal investment):

- *What do I know about it and does it affect me on an emotional level?*

The other aspect includes variables that signify consideration of priorities individuals make with their time and consequently, action:

- *How do I want to spend my time?*

This second avenue of questioning takes account of variables such as desires, habits and peer influence. The link between knowledge and understanding and sensitivity was made in the interviews when pupils referred to the *switching off* that took place when education became repetitious in its provision, and in the *distancing* that occurred within the individual as EE became progressively more global and 'futuristic' in its focus (sections 4.4.2.2, 4.5.4 and 5.2.7).

Some of the differences that appeared in the factor analysis of the questionnaire statements suggest that the *environmental thinking* approach with the younger pupils is slightly less convoluted than that of the older pupils. The factor loadings became progressively less well defined with each increasing age group of girls. In part, this will be due to the inadequacy of the questionnaire statements to cope with the adolescent girls' increasingly complex considerations with respect to their beliefs and, consequently, actions. Not only do approaches to *environmental thinking* change as the pupils progress from one year to the next, but successive cohorts show subtle differences in the detail of their approaches. This has implications for the production and widespread implementation of generic EE programmes.

One pupil [Pupil 18] in Cohort A, year 8 freewriting, wrote of not thinking about environmental issues because of the anxiety this generated in her:

'... I wish I could do more, but I don't know where to start. I don't worry about things like the ozone layer. If I thought about it for too long I would scare myself. Environmental issues are important to me but they will never take over my life.'

This may be a defense mechanism for coping with intolerable anxieties; such large-scale concerns would impinge on pupil 18's development if she allowed them to overwhelm her:

'Psychic health, emotional development and, on a basic level, getting on with your life, is also dependent on being able to block off experience or feelings which are just too difficult to take in, all at once, or all of the time.'

(p195, Lucey and Reay, 2000)

This pupil's approach to some environmental issues (avoidance) appears to be a tactic used by a number of pupils at the case study school. Alison (Yr 11) conceded that she was 'scared' about the future, Bev (Yr 11) remarked that having her own children may force her to re-think her actions and Bronwen and Lily had made it clear that the large geographical and temporal scale of many environmental issues was responsible for their inaction. This may be a self-protective mechanism that individuals use when locus of control is externalized and conscience may conflict with desires (Payne, 1997).

6.4.7 Full will and habit

Pupils have to make choices, decisions about action they will take, that can involve many wills in conflict. Certain behaviours will necessitate consideration of consequences in relation to family, friends, teachers, non-familiar individuals and themselves. Although pupils in this study could recall learned theory that supported their views that action should be taken by individuals to reduce negative environmental impact made by humans, they were apathetic

about behavioural changes they could make (section 5.4.1.3). This suggests a lack of meaningfulness in the EE they receive, ineffective engagement in the learning. During interviews pupils commented on the distance to recycling bins as inhibitors to environmental action and how behaviours that had been encouraged by EE activities were often short-term (section 5.2.7). Mitigating factors were identified at the highest level in the school, with the Head teacher (2002) remarking that the infrastructure of a social system was key in the behaviour moving from intention to action (section 5.5.1).

In his writings of 387-8 BC, St Augustine (1961) accounts for this; when an individual has wills that are in conflict over paths that are viewed with the same degree of desire, *'It is the same soul that wills both, but it wills neither of them with the full force of the will. So it is wrenched in two and suffers great trials, because while truth teaches it to prefer one course, habit prevents it from relinquishing the other.'*(p175). Scott and Oulton (1998) suggest that a disturbance in our circumstances, at school or work, can mean we do not follow habitual behavioural patterns we would at home like putting empty drinks cans in the aluminium bin. This is an example of a (Skinnerian) programmed behaviour that only occurs if the surrounds (external cause) are conducive -the pupils do not go in search of the appropriate bin, it is not part of their *being* (internal cause) to not put a can in the wrong bin. Depending upon the infrastructure provided at school, this action can then become an accepted behavioural code amongst the pupils - a consequence of structure-agency duality (Payne, 1999).

The commitment required for a full will for responsible environmental behaviour is not unlike Sahni's (2001) reference to an individual's *will to act* in order to strive towards responsible social action, where '*...the idea of 'will' touches on the degree of reflexivity and emotional conviction exhibited by the individual in his/her orientation towards meaningful social action. Meaningful social action, in turn, is predicated on the individual's realisation*

that the deed must consist of an act which transcends finite existence, making him/her responsible for the well-being of future generations.' (p422)

The pupil interviewees had been candid about the low priority that responsible environmental (social) action had in their lives at this time, when compared to the aspirations they held in relation to fashion and boyfriends. In interview, the educators also referred to their perception of the lack of social action commitment in the pupils and their pre-occupation with less transcendental aspirations (section 5.5.1). Without attention to the commitment within the pupil it is unlikely that EE will lead to behavioural changes as,

'It is the power of conviction that enables the individual to value a transcendent deed as an end worth adopting, and which, therefore, anchors the imperatives of responsible social action.' (ibid, p435)

Merleau-Ponty's 'body-subject' argument (Pratt et al, 2000) is reflected in the interview data from both pupils and staff. The fact that many of our actions do not require conscious control means that our minds are freed from these habitual acts and they become easy to perform in an *appropriate environment*. If the environment is very familiar, habits can be very hard to overcome. Pupils talk of recycling at home but not necessarily carrying this philosophy through to school. The home environment may be set up to be much more conducive to the recycling action that the pupils performs. Whereas in school, the recycling bins might be placed at the other end of the school, pupils have not developed habits to carry their waste that distance, but a habit that was more easily set up was that of putting all waste in a 'universal' bin nearer the classroom. If the provisions within the pupils' immediate environment were made more *subject-friendly* then perhaps their actions would be more likely to change.

In interviews, pupils demonstrated *retrospective reflexivity*, reflection on conative issues (what their intentions, plans are), how these contribute to cognitive and affective domains and the relationship all of these components have to their behaviour. With all the EE that is taking place and the successful cognitive development of pupils in relation to environmental issues and potential remedial action, perhaps the one aspect that has not received much attention until now is an education approach that encourages *real-time reflexivity* and progression towards development of **full will**, consequently active behavioural change, not persistence of, or reversion to, habit.

6.4.8 A portrait of environmental behaviour

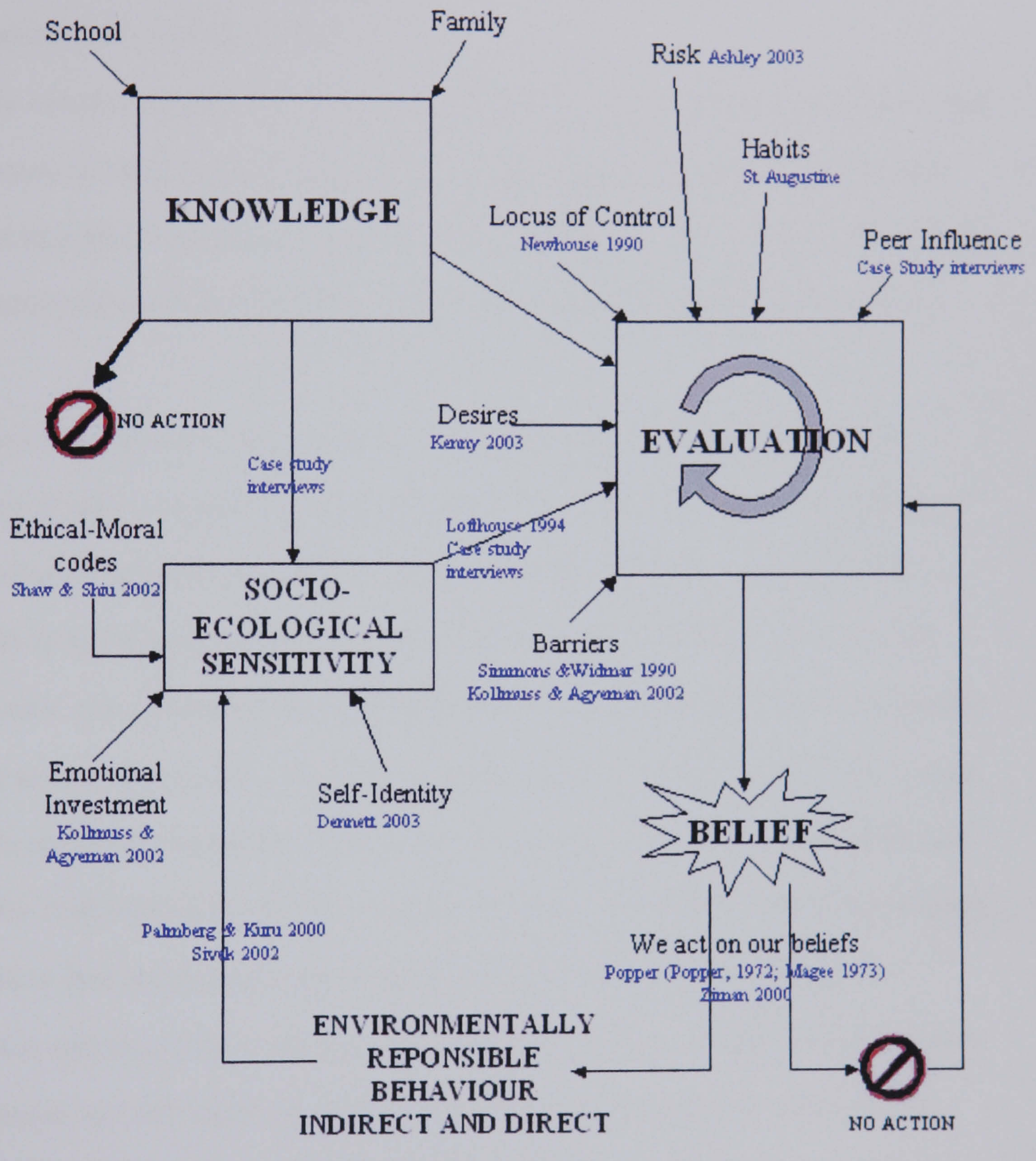
The relationships shown between affect, cognition, behavioural intention and overt action are far from simple. To even attempt to produce a written model one runs the risk of oversimplification. Rather than trying to reduce the complex nature of why some individuals act environmentally responsibly and the barriers that prevent those actions, I hope to begin to illuminate the many facets of environmental behaviour as expressed by female adolescents in the case study. The fragmented self is able to evaluate environmental problems dependent on the situational context, in addition to the influences of cognitive, affective and perceived behavioural controls (Solomon and Sumner, 2001). Figure 21 shows a schematic representation of the various influences on environmental behaviour, based on a combination of previous research and the data explored in this study, references to data and some of the literature have been indicated in the figure. This *Environmental Behaviour Portrait* goes <u>some</u> way to visualizing the complex relationship between influences over environmental behaviour.

The process that takes place prior to beliefs being formulated is an intricate evaluation of information that ranges from the factual to the more affective aspects of an individual's

knowing. The provision of knowledge alone will not necessarily bring about a behavioral response if it is not then evaluated in the light of the affective aspects identified in the figure.

It is not sufficient for EE programmes and environmental educators to focus exclusively on the knowledge component. Nevertheless, evidence collected in this case study suggests that this is what is occurring in the case study school and may be occurring more widely in secondary schools across the UK.

Figure 21- Schematic representation of the influences on environmental behaviour – *Environmental Behaviour Portrait*



7 Implications for Environmental Education

7.1 The Pupils' Environmental Dilemma

The intention of this research project was to contribute to the ever increasing mass of EE research taking place globally by using a more exploratory, qualitative approach to gain more comprehensive evidence (Hallin, 1995).

The common excuse for inaction by the pupils in this case study was based around the ineffectiveness of being the only individual to act 'appropriately' towards the environment. This is not dissimilar to the age old 'prisoner's dilemma' (Ridley, 1996; Dennett, 2003), where it is completely rational to be selfish but with all parties acting rationally, one's demise is secured.

Pupils are aware that their actions are contributing to the collective accelerated degradation of the environment. Each pupil has a finite lifespan. They can all drive cars and take advantage of prepared consumables leading to excess wastage. For every pupil that changes his or her behaviour to become more environmentally responsible, there is a very small decrease in the degradation or even perhaps very slight amelioration. However, in order to take up more environmentally responsible behaviour, each pupil must give up their car and their waste producing consumables. This leads to a change in their lifestyle, they would lose the luxuries. If all pupils gave up their 'negative' behaviours to become more environmentally responsible in their actions, everyone would benefit from large-scale environmental amelioration with less pollution and quieter, safer streets. However, if only one pupil changes their behaviour, the very small change would be spread throughout the population and the individual who made the change would notice no personal beneficial effect. The pupil knows that the best situation for them would be to continue their 'negative' behaviours and reap the benefits of transport and consumable luxuries, but for everyone else to change their ways for a better environment. The pupil also knows that all other pupils will be thinking the same

'selfish' way. So, the pupil knows that by behaving in a more environmentally responsible way, in isolation, they have everything to lose; consequently, it is best to continue the way as before. This is behaviour followed in a moral vacuum, it is not the right or wrong thing to do - it is the rational thing to do.

However, we are moral, rational agents, both qualities with contributions for EE. Environmental educators can follow a purely moral pathway or they can choose to follow a pathway that includes behavioural negotiation. Educators can pursue 'deals' with pupils, incremental steps in behaviour reformation, in such a way that losses to the individual are acceptable and universal application is evident; a tactic identified by Andy Wakefield, an advertising executive, when describing how to change peoples' spending habits such that they saved money (BBC, 2004).

Unlike extreme sociobiologists, who are more fatalistic in humans' behaviours, Diamond (1992) acknowledges our capacity to modify our behaviours in light of our ever-increasing knowledge. Ridley (1996) reminds us that *'nice strategies'* win out in the end and that perhaps we have much to learn from game theory.

7.2 Continued Evolution of Environmental Education

Schools are key role players in the provision of EE (Gayford and Dillon, 1995), education that needs appropriate attention before the end of pupils' compulsory schooling (Grace and Sharp, 2000b). EE has suffered (see Huckle, 1993 for a discussion of a number of the inhibitors to this development) whilst its relatives, the natural sciences, have seen priority and importance placed on their shoulders. The arguments used in the promotion of the public understanding of science (Driver *at al*, 1996), and therefore science education being given the high status it has in school curricula, applies directly to the public understanding of

environment and environmental science. EE needs to be sustainable and it too needs to develop, to evolve. [This is still needed in NC science education, which has retained an approach in line with the dominant paradigm, instructed by value-free philosophy (Ashley, 2000; Littledyke, 2003)]

Hungerford *et al* (1980) referred to an issue that has plagued EE, certainly at the secondary level, in the UK over the successive two decades; action oriented EE goals have not been successfully translated into action-oriented education provision. However, their use of the term *receiver* for the individual to be reached, through formal or non-formal education, does not sit comfortably with me, or the philosophy described above. It is interesting that Hungerford (Simmons and Volk, 2002) later rejected his 'targeted behaviours' reputation. He described behaviour as '*... patterns of carefully considered actions.*' (p8) and stated that it was his desire to enable students to make informed decisions, act on these decisions and participate as citizens.

The challenge for science, science education and thus EE is to

"...overcome the separation between truth and virtue, value and fact, ethics and practical necessity. To call for this nonseparation, is, of course, to ask for a tremendous revolution in our whole attitude to knowledge."

(p 67, Bohm, 1988)

The interview evidence with the case study girls suggests that individuals need to be part of the whole *process* of EE such that they are personally *involved* in the *ends*, what Evans (2001) refers to as, ecological rationality, allowing them to not only determine '*...how to achieve a given end, but also about what ends to pursue in the first place.*' (ibid, p182). It needs to be approached in a more post-modern way, such that we appreciate the science informing it, in context:

'First-world science is one science among many; by claiming to be more it ceases to be an instrument of research and turns into a (political) pressure group.' (p3, Feyerabend, 1993)

The interview evidence with girls in this study go some way to supporting the need for reuniting values with facts, subject with object and emotions with reason. The girls are calling for education that is more personal, something through which they can feel empowered. This reflects a *qualitative* change in outlook rather than the *quantitative* dimension espoused by modern western curricula (Bonnett, 2002). A move to *'education for environment'* may be in order, purposefully removing **the**, implicitly including all humans and thus negating the defensive position by those who utilize the environment (Jickling and Spork, 1998). This move is dependent upon a change in the human-environment dichotomy that pervades education and, consequently, society. This still needs to be built in with local action. Regardless of the knowledge that is built up within individuals about environmental issues, if there is no exploration and acquisition of skills, individuals really have no choices for action (Stevenson, 1987).

7.3 A Socially Critical Approach

Environmental issues are often built on the scientific, and the scientific is not stagnant. This requires individuals in society to be able to think critically, with vision, about the environmental and social problems to be faced.

A socially critical orientation does not need, as suggested by Scott and Oulton (1998), to lead to indoctrination. Pupils are citizens of a society; they do not exist in isolation, for which a liberal stance would be appropriate. Their lives are politicized; they should have political knowledge to use in their decision-making (Stevenson, 1987). State school education

is political; it is driven by a designed curriculum that reflects the authoritarian view of characteristics of citizens useful to society (Spring, 1998) and of scientific knowledge, in a society that leans towards industrial and economic superiority. Consequently, the education being provided to these students needs to allow them to develop their values and beliefs in their social milieu (see Sivek, 2002; Grace and Ratcliffe, 2001).

Individuals are transformed by their active participation in societal reform; to transcribe *'active participation'* into *'active value/attitude formation'* is to distance oneself from the philosophy of EE. Reducing EE to simply an 'internal' level of action (Walker, 1997), there is little, perhaps no, consideration of other influences on responsible environmental behaviour such as locus of control, social influences, acquisition of skills and ownership of environmental problems, influences that can only be explored in a contextual situational setting (community / school collaboration, real-time, local problems that students are physically involved in exploring **and** solving). A truly critical approach is possible when the multiplicity of approaches is uncovered (Stevenson, 1987) for the students to explore.

7.4 What a more Feminist approach has to offer

There is an increasing appreciation that there are a multiplicity of ways of looking at environment and environmental issues depending upon the context of the individual. Education provision should avoid making assumptions about individuals or even denying their individuality. Consequently, EE will need to be tailored to context, not only in geography but also to social location and moral-ethical code of the individual.

The learning taking place should not be so much *transferable* (Milà and Sanmartí, 1999), indicating that former knowledge is rigid and simply moved from one setting to another and added to new knowledge, as *transposable*, referring to the fluid nature of the knowledge

and the ability of the student to move it from one setting to another with a change in its application. EE should be relevant to the student, taking into account culture and recognizing values. However, the model, that Milà and Sanmartí suggest, is proposed for use in assessing and, consequently, designing EE units. I consider that this is moving away from a more postmodern approach and runs the risk of treating subsequent students in a manner that will have been retrospectively designed for their predecessors. Environmental attitudes are not only variable across cultures (Leung and Rice, 2002) but also across generations (Kasapoğlu and Ecevit, 2002). EE programmes will need to be sufficiently fluid that they can evolve at the time the students are taking part in it, not adjusted at a later date. A more suitable educator-student relationship would be that of *'share and do'*, as Gough refers to in his discussion of Earth Education (1987).

Throughout chapters 4 & 5, I have reported on characteristics that the girls have identified as preferred learning approaches or whose deficiency they have linked to less than favourable evaluations of EE provision. This interview evidence supports the request for inclusion of a more feminist perspective in EE provision (Di Chiro, 1987; Gough, 1999a).

The arguments behind the request need care in interpretation, as they have the facility to carry undertones of cultural eco-feminism (Buckingham-Hatfield, 2000). However, a commonality does seem to exist between the criticisms leveled at the dominant scientific paradigm for both EE and female learning, such that Longenecker (1997) goes so far as to say *'... women's empowerment, ecological conservation, and environmental protection are, literally, the same thing.'* (p11). This does not deny the role of men or the importance of EE to both young and older male students, as there is a lack of evidence that responsible environmental behaviour is linked to gender (Hines *et al*, 1986). Both men and women, together, would then be able to take on their roles in a *'partnership ethic'* with nature (Merchant, 1996). The adjustments that would need to occur should not remain an acceptable

reason and *'... do not justify prejudices which keep half of mankind from participating in planning and decision making, especially at a time when the other half, by its competitive escalation and acceleration of technological progress, has brought us and our children to the gigantic brink on which we live, with all our affluence.'* (p292, Erikson, 1968).

A more critical, and feminist, approach to EE would encourage the collaborative atmosphere, where the authoritarian role of the teacher is shed and teacher and student engage in dialogue (Freire, 1993), identified as *'... a powerful learning experience.'* for women (p216, Belenky *et al*, 1997) – sections 5.7.1. & 5.7.2.

Educators need to promote a shift in the environmental response of pupils:

They should → We/I could → I do

Previous codes and rules for environmentally responsible behaviour should be used as stimuli for dialogue, not prescriptive methods for lifestyle. The uncertainty associated with environmental issues (an absence of absolutes) makes behaviour rules, the imposition of specific actions, increasingly morally unjustifiable (Ashley, 2002) and *'... where authority replaces reciprocity, the sense of community fades.'* (p262, Ridley, 1996), inviting antagonistic behaviour.

7.5 Bringing 'Feeling' back into Education

We, as individuals, all have differing capacities within us and, equally, we all have some incapacities (Midgley, 1981). It is not appropriate to believe that by *training* an individual in the accepted environmental behaviours, that it would necessarily result in

internalization and a change in the individuals' behaviour. Some people will simply not *feel* as deeply about their environment as others.

Students should not be provided with EE in the format of teaching yet another curriculum subject. Individuals come to see the environment as separate to them and they despise it for placing potential restrictions on the lifestyle they wish to cultivate. The lifestyle they want involves freedom. This freedom allows individuals to develop the capacities they have within them, their natural feelings; feelings that will be particular to the individual, just as the capacity for empathy varies from one person to another (Baron-Cohen, 2003).

In this case study, Kath's capacity for leisurely walks with family and friends had contributed to her appreciation of the walking environment. Bronwen's capacity for scientific enquiry at a young age had provided her with many opportunities to explore the wider environment. Both these girls displayed capacities that contributed to their early, positive feelings for environment. Another individual may develop a more urban association due to their particular capacities. This affinity for urban, man-made consumer oriented environments was identified in interviews by girls referring to the importance of shopping in their social lives.

There may be yet another individual who has not shown any directional tendencies at all, in which the development of capacities is highly influenced by the family unit. In this case the influence provided at home may lead to the withdrawal of responsibility of the individual to make choices and thus exercise freedom. They may not make a decision on how they feel about the local, national or global environment and thus refuse to act in a way contrary to the family policy at present. There are examples of this in interview evidence when pupils use the excuse that the parents do not recycle materials and therefore they do not have the ability to do so (freedom is removed) and, consequently, they behave the same way as the parents. Perhaps

the children have given up the freedom to make and act on their own decision, as there is no *heart* in the issue.

This is a fundamental problem with EE as I see it. The present structure of EE does not provide the opportunity for individuals to explore their feelings towards the rest of their environment, to even explore how *they* fit into the environmental jigsaw. Many current EE practices involve only reasoning in order to promote what is seen by authoritative sources as appropriate behaviour. A number of eminent scientists have remarked that truth and complete understanding will not come about from (western) scientific reasoning alone (Keller, 1983). By avoiding exploration of the affective, humans objectify the non-human environment and, consequently, the emotional-distance generated between human and non-human qualifies actions that in any other relationship would be deemed insupportable (Goldsmith, 1996).

Substituting the word 'emotions' for 'heart', it has been written elsewhere that the intellect, the ability to make rational decisions in order to move towards a goal, is not exclusive in the mind's functioning:

'...the emotions...work in harmony with the intellect and are indispensable to the functioning of the whole mind. The problem with the emotions is not that they are untamed forces or vestiges of our animal past; it is that they were designed to propagate copies of the genes that built them rather than to promote...moral values' (p 370, Pinker, 1998)

In order to make truly intelligent, rational decisions, individuals should be able to draw on the cognitive and the affective (Iozzie, 1989), reason and emotion (Goldsmith, 1996); *'Ideally...we are neither completely rational nor completely emotional, but manage to strike the elegant balance between the two that we refer to as emotional intelligence.'*(p144, Evans, 2001).

Humans are very good at acting favourably towards another human with the expectation of something in return at some later date. This is an important consideration for EE. School children regularly show this characteristic of *reciprocal altruism* (p403, Pinker, 1998), such as giving a friend some of their sweets, because the individual assumes at some time in the future the favour will be returned. This is based, clearly, on being able to 'read' their friend and make a judgment that they are trustworthy. A lack of emotional linking to the rest of their environment makes individuals unable to 'read' it and, consequently, feel less inclined to act in ways that would be altruistic, as they cannot see the reciprocal nature of their action: *'Why should I bother?'* and *'It's not worth it'*.

I agree with Tilbury (1995) that, rather than avoiding dealing with values in education, teachers should be actively promoting student consideration and development of personal values. It could be considered that, in the absence of open exploration, they are in fact imposing aspects of their values on the pupils. Education is value-laden (Scott and Oulton, 1998) and consequently teachers need training that allows them to comfortably deal with the implications of this, in lesson planning and in interacting with pupils, both in and out of the classroom. All teachers would be better equipped to take part in this education and so end the monopoly by the Geography and Science departments (Gayford, 1993); a monopoly that, from the evidence in this study, appears to have remained relatively well established. Science fact, taught within these curriculum areas, should not be used to dictate an environmental moral code; a code that should be personally, as well as socially constructed, and developed from within ourselves, not from the factuality of science (Gould, 1999).

7.6 Reconnecting

The importance of the way in which individuals think about the world cannot be emphasized enough. By developing an awareness of the intricate enfolding of our 'selves' with the rest of our environment we can deal with the world as a whole and realize our role in it. This will take away the satisfaction with technical solutions to problems, as when considered as an inseparable part of the whole world, we will have feelings, such as love, that we would have for any thing that is close to our hearts (Bohm, 1988). The neglect of the interconnectedness of life processes may well be sustained by the *'dominant development paradigm'* (Palmer, 1998), whereas the re-awakening of our knowledge and understanding of life's plexus has elements of Lovelock's Gaia Hypothesis (1979). This view of life widens the application of McClintock's *'...a feeling for the organism.'* (p198, Keller, 1983).

The persistent negative imagery in the newspapers, on television and across other forms of media communication may well cultivate a mood of apathy in the population. It is clear to see why individuals take the stance that there is no point in acting as their action will be insignificant and thus have no affect globally. Nevertheless, this stance is morally void and thus of no use to the development of society.

It may not be helpful for individuals to consider whether their actions are insignificant globally or nationally, and that they will have no effect. In isolated analysis it may well seem true. What is important is that each individual takes up the right of freedom, freedom to develop their capacities and look into their heart to develop values towards the rest of their environment. Their mind should be satisfied that they have acted with heart. Each individual must move away from a competitive-comparative perspective in relation to environmentally responsible action. Environmental problems need to be tackled in a more localised approach. Each individual needs to act at the personal level as well as at the community level. By trying

to tackle global problems globally, individuals provide themselves with the justification to cry out: *Impossible!, Will not make a difference! and Why should I if no one else is?.*

Environmental action will need global support, but its seed is individual action. However, and this is an irremovable clause, the individual action **must** be interconnected in order for the rest of the environment to respond in a way that we (wider society) come to agree is desirable or favorable. If the approaches to environmental problems are fragmentary then it is likely the environment will respond in a fragmentary way (Bohm, 1988).

Humans need to truly *know* their surroundings,

'Several thousand Cuahuila Indians never exhausted the natural resources of a desert region in South California, in which today only a handful of white families manage to subsist. They lived in a land of plenty, for in this apparently completely barren territory, they were familiar with no less than sixty kinds of edible plants and twenty-eight others of narcotic, stimulant or medical properties' (Levi-Strauss in Feyerabend, 1993, p3)

and not take control of and master them, thus providing for a sustainable educational future. This need to '*know*' is echoed by 'bushcraft' educators who emphasis the principle of ***kinship*** with the rest of one's environment as central to this aspect of EE (BBC, 2004). I agree strongly with Orr (1992, 1994) that education for ecological literacy without tending to the growth of a sense of kinship (ties with all of one's environment) in the individual is simply inadequate. The sustenance for this growth will probably come from an adult; it will come from community. Pupils in this case study are not novel in their references to adult influence on their environmental thinking, it is not uncommon for high profile environmental 'personalities' to refer to a particular adult who encouraged them in their childhood. This emphasizes the huge responsibility that falls on teachers simply because of the number of

waking hours they spend with young people; teachers, who themselves, may not have developed their kinship with environment.

7.7 Finally

Environmental education with adolescents needs attention. Students in this case study have provided further evidence of the unsatisfactory state of EE in secondary schools. This is especially worrying as:

'Adolescence is ... a vital regenerator in the process of social evolution, for youth can offer its loyalties and energies both to the conservation of that which continues to feel true and to the revolutionary correction of that which has lost its regenerative significance.'

(p134, Erikson, 1968)

APPENDIX I
Reliability of freewriting coding

Initial inter-researcher reliability (pre-revision)

Cohort	% coding agreement of Checker 2 with author		
	Coding for Q1	Coding for Q2 Temporal	Coding for Q2 Proximity
A Year 8	81	63	52
A Year 9	56	59	63
A Year 10	68	60	64
A Year 11	73	77	69

Cohort	% coding agreement of Checker 1 with author		
	Coding for Q1	Coding for Q2 Temporal	Coding for Q2 Proximity
A Year 8	67	63	52
A Year 9	70	65	63

Revised inter-researcher reliability (using revised coding frames)

Cohort	% coding agreement of Checker 2 with author		
	Coding for Q1	Coding for Q2 Temporal	Coding for Q2 Proximity
A Year 8	96	78	74
A Year 9	74	81	85
A Year 10	88	71	79
A Year 11	81	85	92

Cohort	% coding agreement of Checker 1 with author		
	Coding for Q1	Coding for Q2 Temporal	Coding for Q2 Proximity
A Year 8	89	85	74
A Year 9	89	85	78

APPENDIX II

Proportions of feeder schools represented by pupils in case study school – for those pupils referring to humans in their written concept of 'environment'

Cohort A Year group	Feeder Schools (for students that used humans in the statement to describe 'environment')							
	AM	CH	BP	WM	BM	OS	XX*	Total
8	3	2		2	2	2	2	13
9	2	2	2	3	1		1	11
10	3	3				1	1	8
11	3					1		4

XX= schools that have fed into the case study school but are low frequency situations (such as move from one county to another, move from prep school) - *each entry in XX is a different establishment

Cohort B Year group	Feeder Schools (for students that used humans in the statement to describe 'environment')								
	AM	CH	BP	WM	BM	OS	FM	XX*	Total
8		1				1	2	6	10
9								1	1

Cohort C Year group	Feeder Schools (for students that used humans in the statement to describe 'environment')							
	AM	CH	BP	WM	BM	OS	XX*	Total
8			2		1		8	11
9							3	3

XX= schools that have fed into the case study school but are low frequency situations (such as move from one county to another, move from prep school) –*each entry in XX is a different establishment

APPENDIX III

Students in Cohort A (ID number) using humans in their understanding of the term 'the environment'			
Yr 8	**Yr 9**	**Yr 10**	**Yr 11**
1	1		
2			
5		5	5
6		6	
	7		
9	9	9	
10	10	10	10
	11		
	12	12	
	13		
		14	14
17			
19			19
20		20	
		25	
Total number of students			
13	11	8	4

It is unfortunate that three of the pupils who were recorded in the Year 8 sub-group were absent for lengthy periods of time later in their school careers, such that they were prevented from taking part in the freewriting task at these points– two in Year 10 [Pupils 17 and 22] and one in Year 11 [Pupil 1], so it is not possible to say if they would have formed part of the sub-group in those years.

APPENDIX IV

Rank* list produced using environmental issues identified by pupils in their freewriting

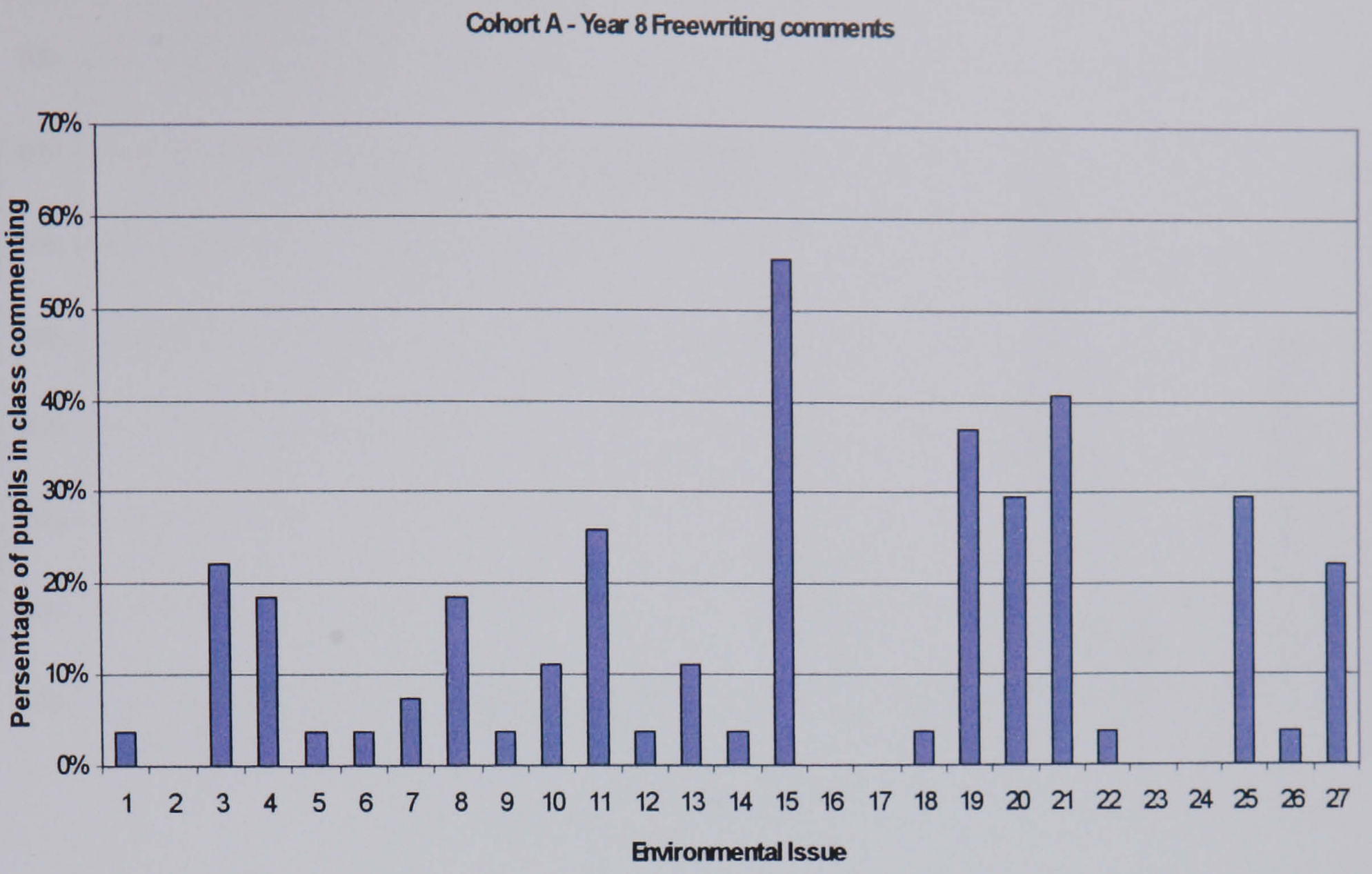
LOCAL

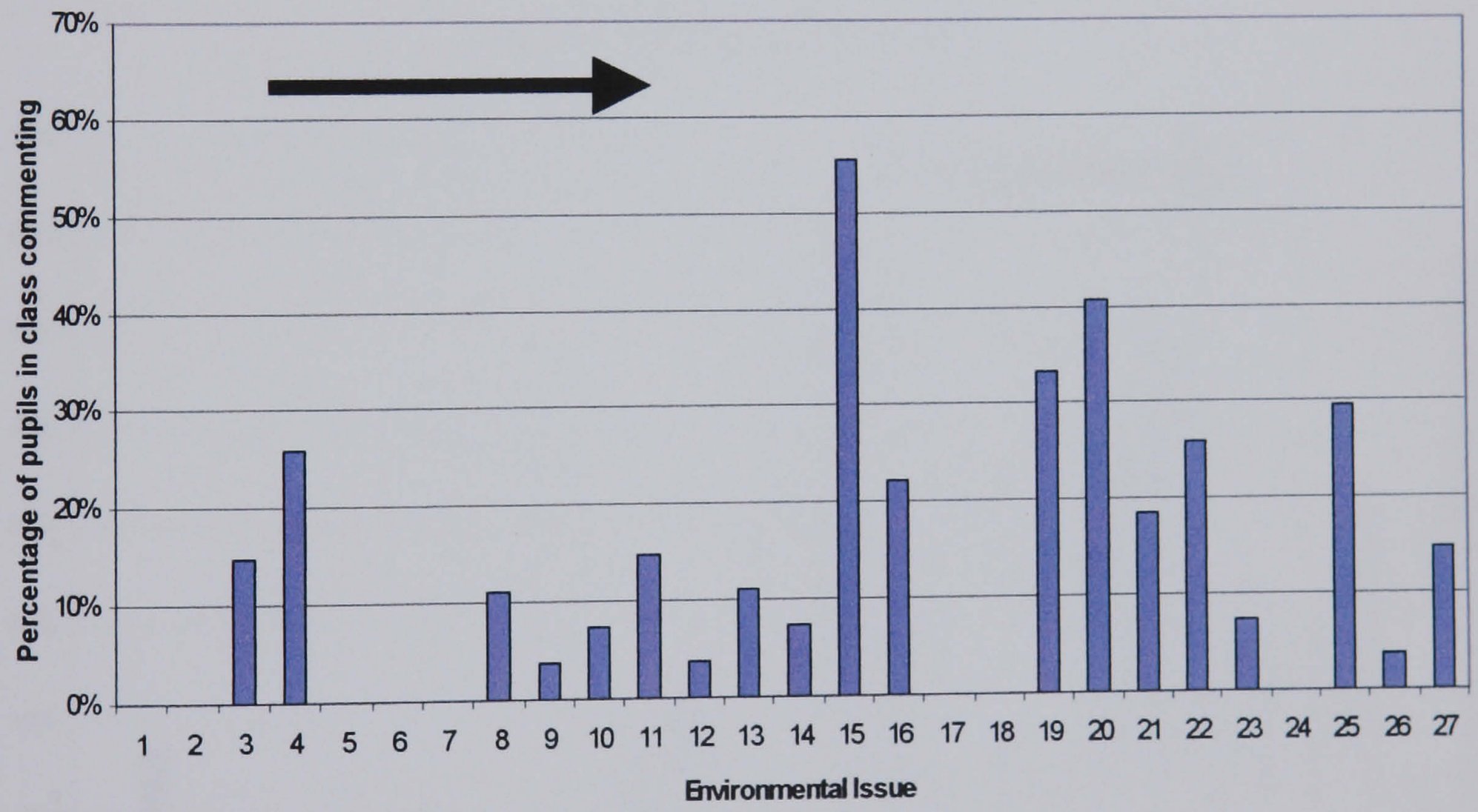
	Environmental. Issue
1	Graffiti or Vandalism
2	CO Poisoning
3	Litter
4	Cleanliness (incl. aesthetic comments)
5	Water conservation
6	Electricity/energy conservation
7	Reference to lack of local resources
8	Building (houses/roads)
9	Drugs problem
10	Waste disposal/rubbish
11	Recycling
12	Noise Pollution
13	Reduce car use
14	Animal testing
15	Pollution (general, air, smoke etc)
16	Socio-political comment
17	Oil Spills
18	Non-renewable resources
19	Loss/damage of (animal) habitats
20	Endangered/Hunted animals/animal *numbers* affected
21	Deforestation
22	Rainforest
23	Human population affected (+/-)
24	Acid Rain
25	Ozone layer/CFCs
26	Polar Caps Melting
27	Global warming / Greenhouse effect

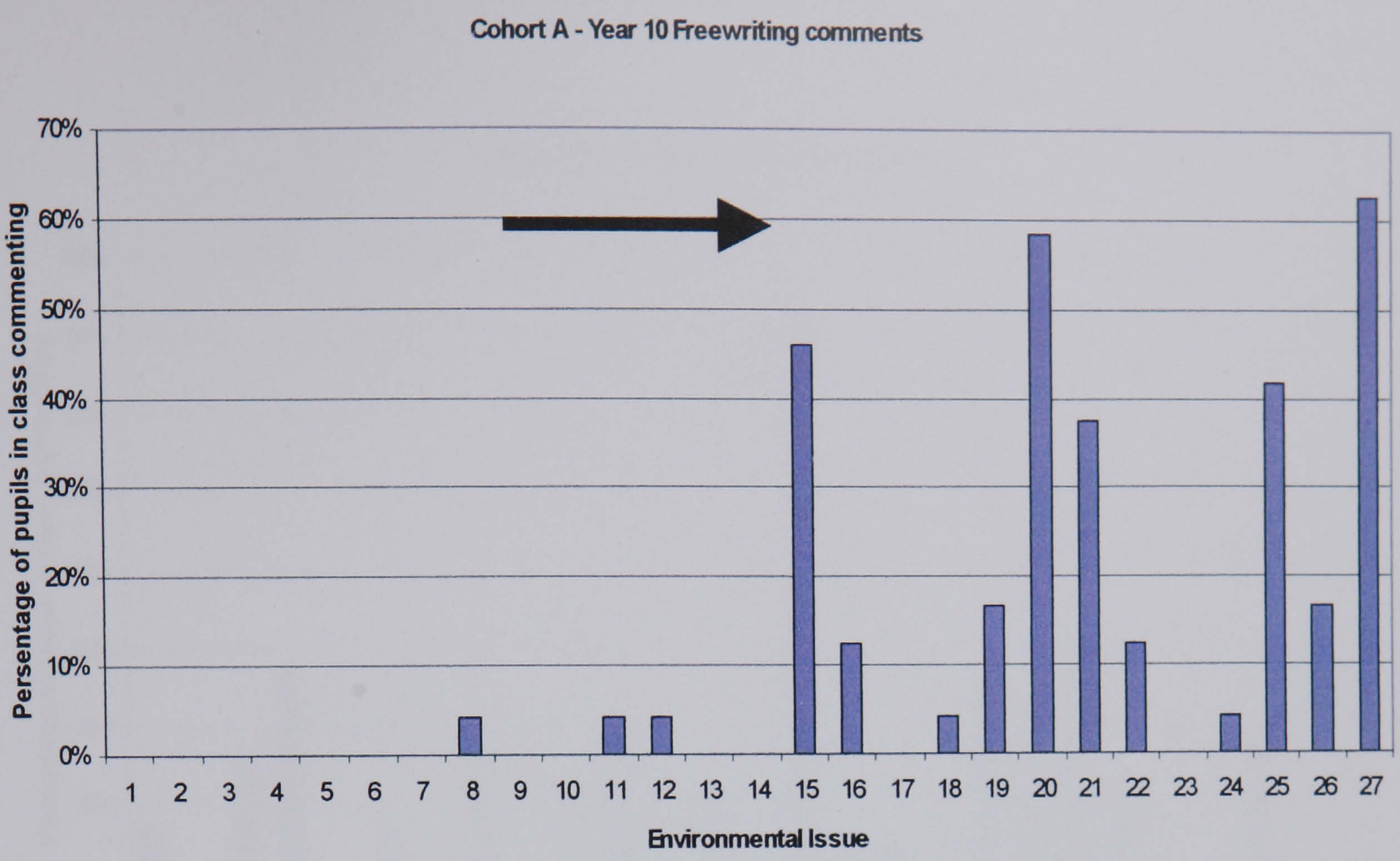
GLOBAL

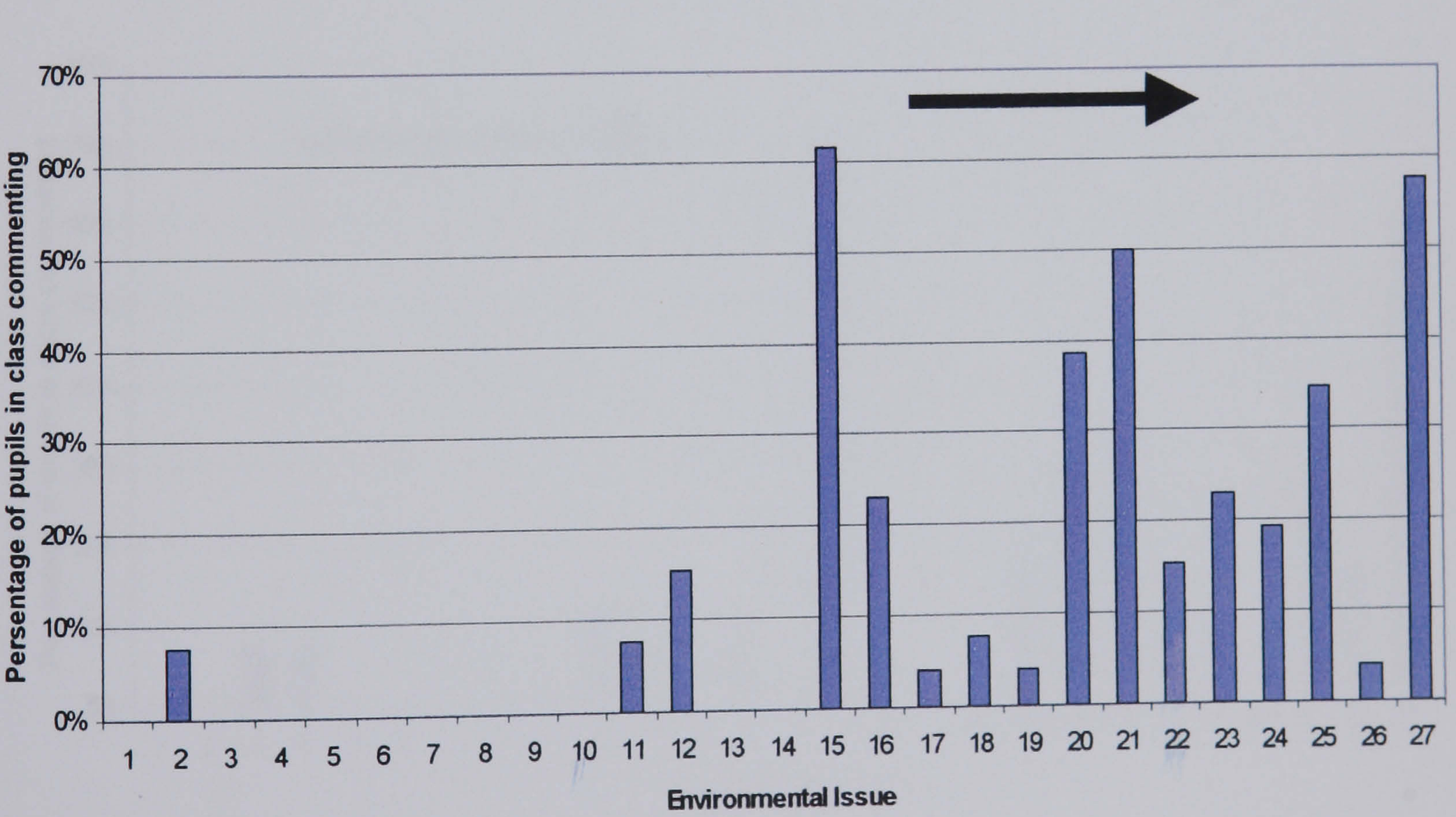
* Rank number in list is used in graphs in Appendix V. In section 4.4.2.2. where reference is made to issues in the lower half of the list, this includes all issues numbered lower than 14 (vice versa).

Changes in environmental issues concern for cohort A over their four years of secondary schooling

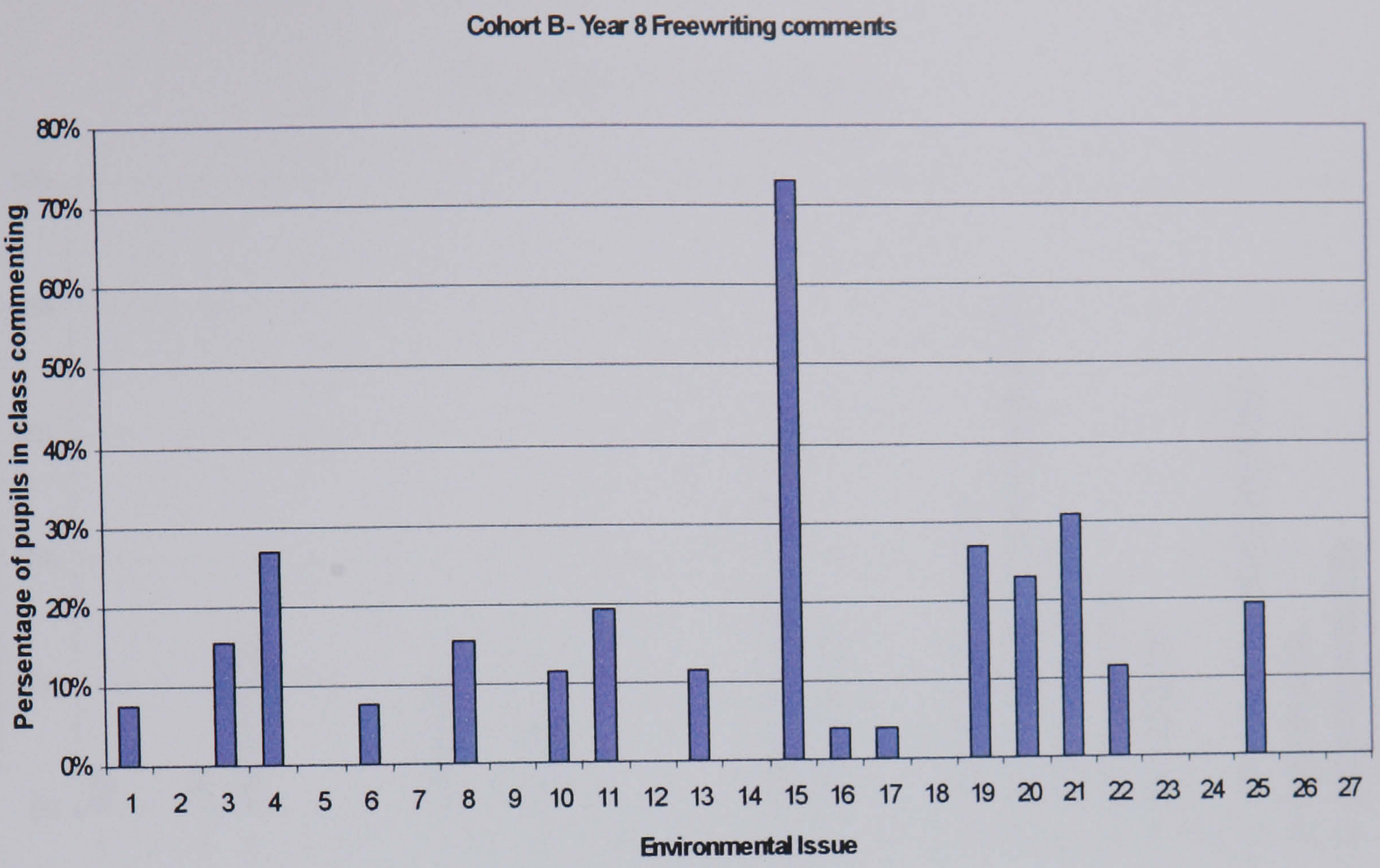


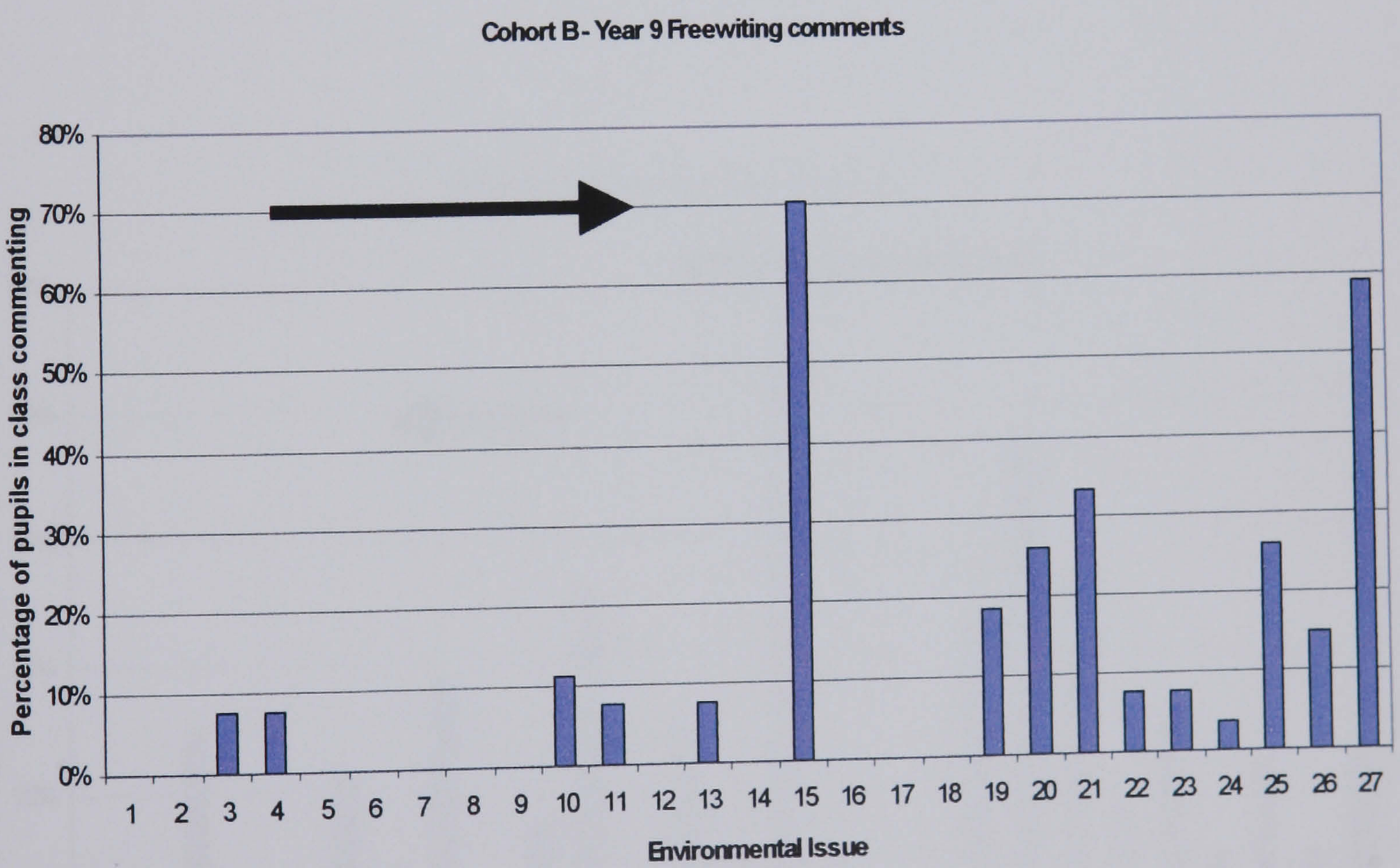



Cohort A - Year 10 Freewriting comments
Persentage of pupils in class commenting
70%
60%
50%
40%
30%
20%
10%
0%
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
Environmental Issue

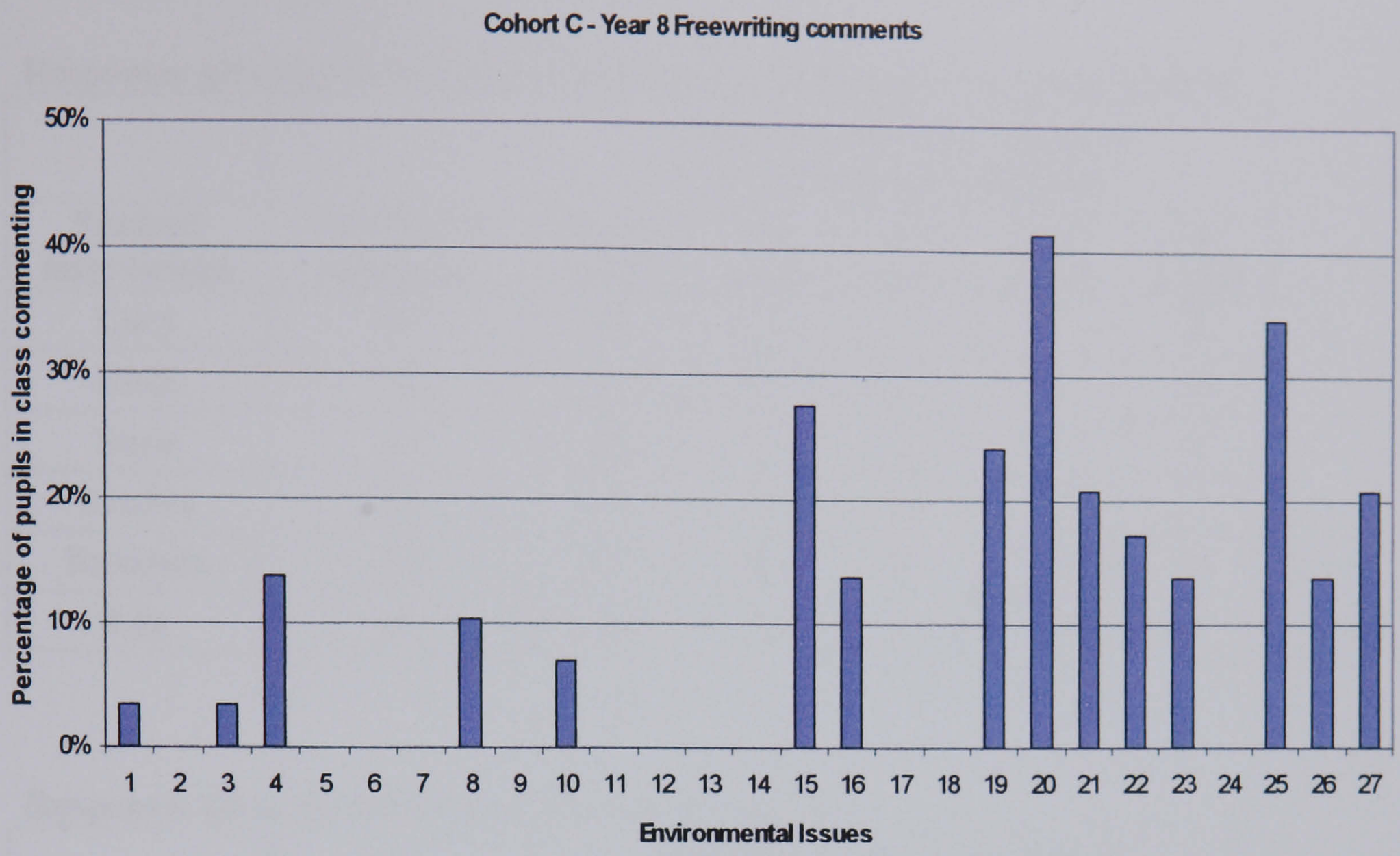

Cohort A - Year 11 Freewriting comments
Persentage of pupils in class commenting
70%
60%
50%
40%
30%
20%
10%
0%
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
Environmental Issue

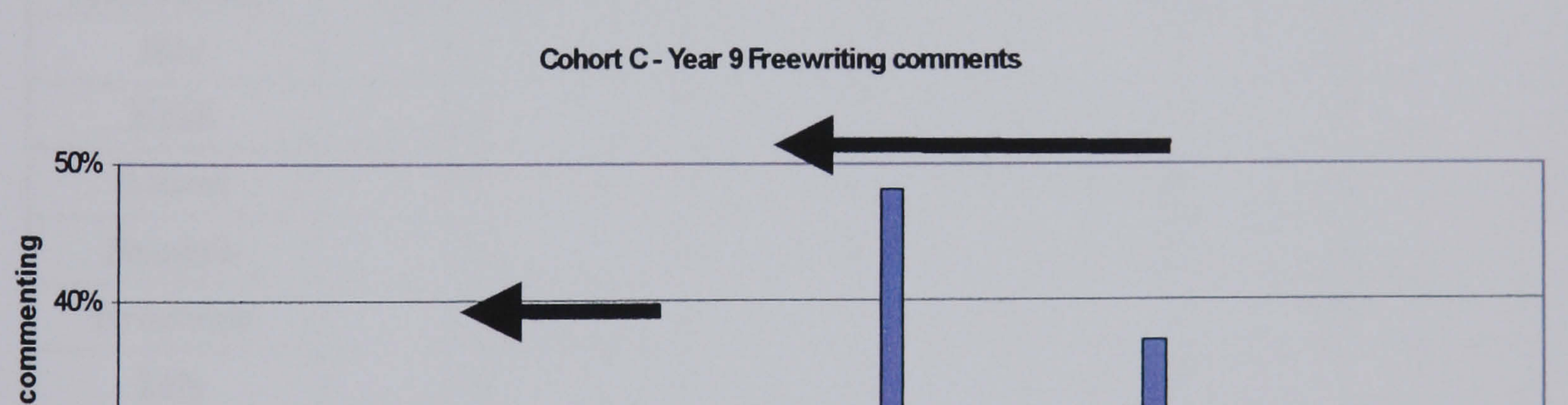
Changes in environmental issues concern for cohort B





Changes in environmental issues concern for cohort C





APPENDIX VI

Lengths of responses given by interviews – indicating degree of elaboration and ease at answering questions

Responses given by informants in preliminary informal interviews (Year 9)

		Number of words in response (Percentage of responses)				
Student interviewed	**Number of responses**	**Single word**	**2-10 words**	**11-20 words**	**21-30 words**	**31+ words**
Lucy	42	40	48	7	5	0
Kath	50	26	18	28	12	16
Susie	55	18	51	20	9	2
Sandra	55	38	31	18	6	7
Bronwen	166	25	38	14	8	15
Lily	80	18	53	15	10	4

Responses given by informants in Year 10 interviews

		Number of words in response (Percentage of responses)				
Pupil interviewed	**Number of responses**	**Single word**	**2-10 words**	**11-20 words**	**21-30 words**	**31+ words**
Bev	86	42	16	19	9	14
Kath	126	37	21	9	8	25
Alison	82	27	25	16	16	16
Sandra	70	23	20	12	19	26
Bronwen	50	18	22	18	12	30
Lily	137	38	31	15	9	7

Responses given by informants in Year 11 interviews

		Number of words in response (Percentage of responses)				
Pupil interviewed	**Number of responses**	**Single word**	**2-10 words**	**11-20 words**	**21-30 words**	**31+ words**
Bev	130	42	8	12	3	35
Kath	93	26	18	10	4	42
Alison	60	13	18	12	15	42
Sandra	84	29	24	7	14	26
Bronwen	121	18	23	22	15	22
Lily	67	22	15	15	5	43

APPENDIX VII
Reliability and validity of interview coding using N6

a)

Transcript checked for inter-researcher reliability	Number of coding sections given by author/researcher (A)	Number of coding sections given by second researcher (B)	Percentage of B that agreed with A before collaboration	Number of coding sections given after collaboration
Alison Yr 10	45	38	61	46
Sandra Yr 11	40	37	78	39
Lily Yr 11	27	26	69	32

b)

Coding category (Node)	Number of sub-categories (Y)	Number of sub-categories that emerged in Yr 10 and Yr 11 interviews (X)	X expressed as a percentage of Y
Influences on pupils' interest in a club	12	8	67
Lunchtime activities	4	4	100
Environmental action considerations	11	9	82
Yr 8 characteristics	9	7	78
Yr 10 characteristics	8	5	63
Comments on EE in case study school	11	9	82

c)

Coding category (Node)	Number of sub-categories (Y)	Number of sub-categories that were used by individuals in both interviews (X)	X expressed as a percentage of Y
Influences on pupils' interest in a club	12	5	42
Lunchtime activities	4	3	75
Environmental action considerations	11	3	27*
Yr 8 characteristics	9	5	56
Yr 10 characteristics	8	2	25[#]
Comments on EE in case study school	11	1	9[♆]

*Very fluid opinions –one would not expect these to remain exactly the same for one individual from year to year as both cognitive and affective domains evolve

[#]This was not one of the questions from the scaffold for the semi-structured interviews, it depended on pupil voluntary reflection

[♆]The environmental education the pupils received changed quite significantly over the four years with a decline into Yr10 and at the time of the Yr 11 interviews pupils were covering the UK National Curriculum Biology content (KS 4) for *Human influence on the Environment* (see Chapter 2)

APPENDIX VIII

Independent t-test calculations for mean score analysis

Year 8 2001 compared to:	Results from independent t test calculation				
	t value	df	p (sig 2-tailed)	eta^2	size effect of signif diff
Year 8 2002	-2.134	324	0.034	0.014	small
Year 8 2003	-4.709	338	0.000	0.062	moderate
Year 9 2002	-2.401	342	0.017	0.017	small
Year 9 2003	-6.892	324	0.000	0.128	large
Year 10 2003	-6.237	343	0.000	0.102	> moderate
Year 11 2002	-2.294	289	0.022	0.018	small
Year 11 2003	-6.751	306	0.000	0.13	large

Year 8 2002 compared to:	Results from independent t test calculation				
	t value	df	p (sig 2-tailed)	eta^2	size effect of signif diff
Year 8 2003	-2.640	316	0.009	0.022	small
Year 9 2002	-0.399*#	319.870	0.735	not signif diff	
Year 9 2003	-4.841	302	0.000	0.072	>moderate
Year 10 2003	-4.154	321	0.000	0.051	moderate
Year 11 2002	-0.399	267	0.690	not signif diff	
Year 11 2003	-4.802	284	0.000	0.08	>moderate

*equal variances not assumed

#Levene's test for equality of variances p= 0.048

Repeated t-tests when cases removed if pupil answered positively to statement 6

Year 8 comparison	Results from independent t test calculation				
	t value	df	p (sig 2-tailed)	eta^2	size effect of signif diff
2001/2002	-2.341	311	0.02	0.0007	very small
2001/2003	-5.25	326	0.000	0.08	>moderate
2002/2003	-2.906	301	0.004	0.03	>small

*equal variances not assumed

#Levene's test for equality of variances p= 0.048

Year 8 2003 compared to:	Results from independent t test calculation				
	t value	df	p (sig 2-tailed)	eta^2	size effect of signif diff
Year 9 2002	-2.235	334	0.026	0.015	small
Year 9 2003	2.100	316	0.037	0.014	small
Year 10 2003	1.478	335	0.140	not signif diff	
Year 11 2002	-1.970	281	0.05	0.014	small
Year 11 2003	2.155	298	0.032	0.015	small

Year 9 2002 compared to:	Results from independent t test calculation				
	t value	df	p (sig 2-tailed)	eta^2	size effect of signif diff
Year 9 2003	-4.335	320	0.000	0.055	moderate
Year 10 2003	-3.717	339	0.000	0.039	>small
Year 11 2002	-0.080	285	0.936	not signif diff	
Year 11 2003	-4.293	302	0.000	0.057	moderate

Year 9 2003 compared to:	Results from independent t test calculation				
	t value	df	p (sig 2-tailed)	eta^2	size effect of signif diff
Year 10 2003	0.622	321	0.535	not signif diff	
Year 11 2002	3.931	267	0.000	0.055	moderate
Year 11 2003	-0.147	284	0.883	not signif diff	

Year 10 2003 compared to:	Results from independent t test calculation				
	t value	df	p (sig 2-tailed)	eta^2	size effect of signif diff
Year 11 2002	-3.317	286	0.001	0.037	>small
Year 11 2003	-0.740	303	0.460	not signif diff	

Year 11 2002 compared to:	Results from independent t test calculation				
	t value	df	p (sig 2-tailed)	eta^2	size effect of signif diff
Year 11 2003	-3.914	249	0.000	0.058	moderate

APPENDIX IX
Factor Analyses

Yr 8 2001

Questionnaire Statement	*Variable Categories*	*Component*	
		1	*2*
Q10	ENS & KEI	0.62	
Q15	ENS & KEI	0.62	
Q13	KEI & BEA	0.62	
Q16	KEI & BEA	0.59	
Q30	ENS & BEA	0.58	
Q14	KEI & BEA	0.57	
Q34	ENS & KEI	0.54	
Q21	BEA & LOC	0.53	
Q35	BEA & LOC	0.51	
Q12	KEI & BEA	0.49	
Q17	KEI & BEA	0.49	
Q9	KEI & BEA	0.42	
Q33	ENS & BEA	0.39	
Q31	BEA & ITA		0.67
Q24	BEA & ITA		0.65
Q22	ITA		0.62
Q26	BEA & ITA		0.61
Q23	ITA		0.60
Q25	ITA		0.59
Q27	BEA & ITA		0.52
Q28	BEA & LOC		0.45
% of variance explained after rotation		19.82%	15.83%

Rotation converged in 3 iterations. All scores below 0.35 are ignored.
Correlation matrix examination resulted in 9 statements being removed from the analysis (7,8,11,18, 19,20,29,32 & 36).

Yr 8 2002

Questionnaire Statement	*Variable Categories*	*Component*	
		1	*2*
Q31	BEA & ITA	0.73	
Q24	BEA & ITA	0.68	
Q28	BEA & LOC	0.64	
Q26	BEA & ITA	0.58	
Q8	ENS	0.54	
Q32	BEA & LOC	0.53	
Q27	BEA & ITA	0.50	
Q34	ENS & KEI	0.49	
Q33	ENS & BEA	0.47	
Q21	BEA & LOC	0.44	
Q15	ENS & KEI		0.73
Q10	ENS & KEI		0.67
Q14	KEI & BEA		0.66
Q13	KEI & BEA		0.61
Q17	KEI & BEA		0.57
Q16	KEI & BEA		0.48
Q12	KEI & BEA		0.48
Q30	ENS & BEA		0.45
Q9	KEI & BEA	0.40	0.45
Q23	ITA		0.44
Q22	ITA		0.35
% of variance explained after rotation		16.95%	16.42%

Rotation converged in 3 iterations. All scores below 0.35 are ignored.
Correlation matrix examination resulted in 8 statements being removed from the analysis (7,11,18,19, 20,29,35 & 36).

Yr 8 2003

Questionnaire Statement	*Variable Categories*	*Component*		
		1	*2*	*3*
Q28	BEA & LOC	0.69		
Q21	BEA & LOC	0.64		
Q33	ENS &BEA	0.64		
Q34	ENS & KEI	0.60		
Q17	KEI & BEA	0.57		
Q35	BEA & LOC	0.55		
Q13	KEI & BEA	0.52	0.48	
Q27	BEA & ITA	0.43		
Q15	ENS & KEI		0.69	
Q10	ENS & KEI		0.66	
Q14	KEI & BEA		0.65	
Q12	KEI & BEA		0.61	
Q22	ITA		0.60	0.45
Q23	ITA		0.55	0.53
Q30	ENS & BEA	0.43	0.51	
Q16	KEI & BEA	0.37	0.41	
Q9	KEI & BEA	0.36	0.37	
Q31	BEA & ITA			0.76
Q24	BEA & ITA			0.68
Q26	BEA & ITA			0.67
Q32	BEA & LOC			0.62
Q36	LOC			0.57
Q25	ITA			0.43
% of variance explained after rotation		15.46%	14.39%	14.03%

Rotation converged in 12 iterations. All scores below 0.35 are ignored.
Correlation matrix examination resulted in 5 statements being removed from the analysis (7, 11, 18, 19 & 20).

Yr 9 2002

Questionnaire Statement	*Variable Categories*	*Component*	
		1	*2*
Q13	KEI & BEA	0.70	
Q21	BEA & LOC	0.68	
Q15	ENS & KEI	0.67	
Q14	KEI & BEA	0.65	
Q30	ENS & BEA	0.64	
Q10	ENS & KEI	0.63	
Q34	ENS & KEI	0.57	0.37
Q33	ENS & BEA	0.57	
Q17	KEI & BEA	0.54	
Q9	KEI & BEA	0.53	
Q16	KEI & BEA	0.49	
Q22	ITA	0.47	0.38
Q23	ITA	0.46	
Q35	BEA & LOC	0.46	
Q12	KEI & BEA	0.37	
Q31	BEA & ITA		0.77
Q24	BEA & ITA		0.67
Q27	BEA & ITA		0.63
Q25	ITA		0.61
Q28	BEA & LOC		0.61
Q26	BEA & ITA		0.57
Q8	ENS		0.52
% of variance explained after rotation		22.95%	16.06%

Rotation converged in 3 iterations. All scores below 0.35 are ignored.
Correlation matrix examination resulted in 7 statements being removed from the analysis (7, 11, 18, 19, 20, 29 & 36).

Yr 9 2003

Questionnaire Statement	*Variable Categories*	*Component*	
		1	*2*
Q24	BEA & ITA	0.72	
Q31	BEA & ITA	0.63	
Q32	BEA & LOC	0.61	
Q34	ENS & KEI	0.59	
Q28	BEA & LOC	0.58	
Q33	ENA & BEA	0.57	
Q27	BEA & ITA	0.53	
Q26	BEA & ITA	0.52	
Q22	ITA	0.51	
Q23	ITA	0.46	
Q30	ENA & BEA	0.38	0.37
Q8	ENA	0.35	
Q14	KEI & BEA		0.70
Q9	KEI & BEA		0.64
Q13	KEI & BEA		0.62
Q15	ENA & KEI		0.62
Q10	ENA & KEI		0.61
Q12	KEI & BEA		0.56
Q16	KEI & BEA		0.55
Q21	BEA & LOC		0.55
Q17	KEI & BEA		0.47
Q35	BEA & LOC		0.40
% of variance explained after rotation		16.92%	16.65%

Rotation converged in 3 iterations. All scores below 0.35 are ignored.
Correlation matrix examination resulted in 6 statements being removed from the analysis (11,18,19,20, 25 & 36).

Yr 10 2003

Questionnaire Statement	*Variable Categories*	*Component*	
		1	*2*
Q9	KEI & BEA	0.73	
Q21	BEA & LOC	0.69	
Q33	ENS & BEA	0.69	
Q14	KEI & BEA	0.67	
Q16	KEI & BEA	0.65	
Q30	ENS & BEA	0.63	
Q10	ENS & KEI	0.62	
Q13	KEI & BEA	0.62	
Q35	BEA & LOC	0.61	
Q17	KEI & BEA	0.53	
Q28	BEA & LOC	0.52	
Q29	ENS & PII & ITA	0.50	-0.44
Q15	ENS & KEI	0.50	
Q34	ENS & KEI	0.42	0.38
Q26	BEA & ITA		0.69
Q31	BEA & ITA		0.68
Q23	ITA		0.67
Q24	BEA & ITA		0.61
Q22	ITA		0.58
Q12	KEI & BEA		0.38
Q8	ENS		0.37
% of variance explained after rotation		23.42%	13.87%

Rotation converged in 3 iterations. All scores below 0.35 are ignored.
Correlation matrix examination resulted in 6 statements being removed from the analysis (7,11,18,20, 27 & 36).

Yr 11 2002

Questionnaire Statement	*Variable Categories*	*Component*	
		1	*2*
Q10	ENS & KEI	0.73	
Q30	ENS & BEA	0.68	
Q9	KEI & BEA	0.64	
Q14	KEI & BEA	0.63	
Q33	ENS & BEA	0.61	
Q13	KEI & BEA	0.60	
Q15	ENS & KEI	0.60	
Q21	BEA & LOC	0.58	
Q35	BEA & LOC	0.55	
Q12	KEI & BEA	0.50	
Q28	BEA & LOC	0.46	
Q17	KEI & BEA	0.35	
Q8	ENS		0.68
Q26	BEA & ITA		0.61
Q22	ITA	0.43	0.57
Q23	ITA	0.39	0.55
Q31	BEA & ITA	0.38	0.49
Q27	BEA & ITA	0.35	0.48
Q25	ITA		0.47
Q29	ENS & PII & ITA		-0.47
Q34	ENS & KEI		0.43
Q7	KEI		-0.39
Q24	BEA & ITA	0.37	0.39
% of variance explained after rotation		21.15%	13.78%

Rotation converged in 3 iterations. All scores below 0.35 are ignored.
Correlation matrix examination resulted in 5 statements being removed from the analysis (11,16,20,32 & 36)

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Questionnaire Statement	*Variable Categories*	*Component*	
		1	*2*
Q28	BEA & LOC	0.72	
Q27	BEA & ITA	0.59	
Q34	ENS & KEI	0.57	
Q21	BEA & LOC	0.57	
Q31	BEA & ITA	0.53	
Q9	KEI & BEA	0.52	
Q17	KEI & BEA	0.52	0.41
Q19	KEI & BEA	0.50	
Q24	BEA & ITA	0.47	
Q33	ENS & BEA	0.44	
Q32	BEA & LOC	0.44	
Q8	ENS	0.41	
Q20	KEI & BEA	-0.40	0.40
Q18	KEI & BEA		0.67
Q12	KEI & BEA		0.66
Q23	ITA		0.62
Q22	ITA		0.60
Q13	KEI & BEA	0.36	0.59
Q10	ENS & KEI		0.56
Q30	ENS & BEA		0.54
Q15	ENS & KEI		0.52
Q14	KEI & BEA		0.51
Q26	BEA & ITA		0.47
% of variance explained after rotation		17.59%	16.64%

Rotation converged in 3 iterations. All scores below 0.35 are ignored.
Correlation matrix examination resulted in 5 statements being removed from the analysis (7,11,16,25 & 29)

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